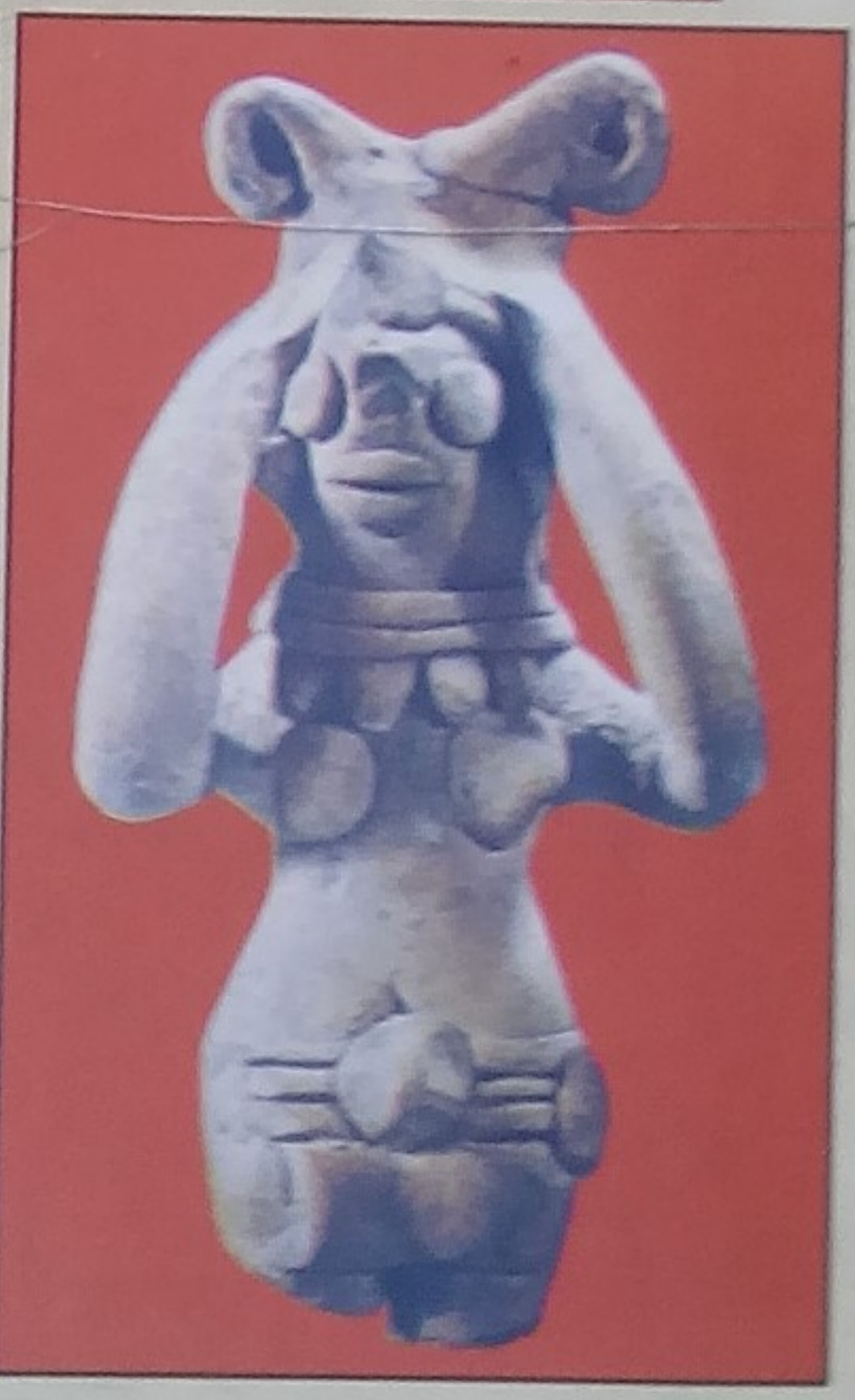
THE END OF THE GREAT HARAPPAN TRADITION



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the 'holocaust' theories of civilizatior
collapse. They attempt to identify so
political, and religious processes tha
could account for the end of the Indu
valley civilization, they argue for
structural strains in Bronze Age
systems. The Indus or Harappa
civilization is placed in a wider
geographic setting to explore not jus
internal factors but also those opera
within the Bronze Age world at large

An appendix gives a brief survey of
post-Harappan cultures, for easy
reference, for students.

The text is illustrated with diagrams
maps, and photographs.

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THE END OF THE GREAT HARAPPAN TRADITION

The Heras Memorial Lectures honour the memory of an eminent historian and archaeologist, the Rev. Henry Heras, S.J., who came to India from Spain in 1922 to be Professor of Indian History at St. Xavier's College, Bombay. In 1926 he founded the Indian Historical Research Institute, later renamed the Heras Institute of Indian History and Culture. He died in Bombay in 1955, after spending more than half of his life in digging up India's past, in order to display to the world the glorious history and culture of the land he made his own and whose citizen he became. The present Lectures are the thirty-fifth in the Series.

Shereen Ratnagar is Professor of Archaeology and Ancient History at the Centre for Historical Studies, Jawaharlal Nehru University, New Delhi. With training at the Deccan College, Pune, and in Mesopotamian Archaeology from the Institute of Archaeology, London, she gained field experience in Turkey, Iraq and the Gulf. She is currently a Fellow of the Indian Institute of Advanced Study, Shimla.

THE END OF THE GREAT HARAPPAN TRADITION

Heras Memorial Lectures 1998
under the auspices of the
Heras Institute of Indian History and Culture, Mumbai

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Introduction

I thank the Heras Memorial Institute for the honour of the invitation to deliver this year's Lectures. I have chosen as my topic the decline of the Harappan civilization, which civilization I will refer to as a Great Tradition.

To begin with, I would like to pay particular attention to how the problem of the decline may be appropriately formulated. There is, for instance, a widespread misconception that it was the people—the Harappan rulers, tillers of the soil, seal carvers and boatmen—who were wiped out. While 'the end of the IVC' is more or less taken for granted, the notion that Harappan culture elements like the bullock cart and method of bead manufacture are still with us is accepted equally unquestionably. Moreover, not enough discussion has been directed to the idea that the decline of this civilization, which had appreciable contacts (albeit in varying degree) with the world at large, could be connected with happenings in Mesopotamia (Iraq), its eastern neighbour in lowland Iran, Elam, Kuwait, Bahrain, Oman, or even Central Asia, particularly in the matter of dependence on imports of metal. We also need to make a consistent attempt to distinguish symptom from cause, event from evidence, and triggers from underlying structural conditions.

What we need to explain is not a population ceasing to reproduce, but how a civilization, and its characterizing culture traditions, came to an end. This civilization was the product of a period of historical development in South Asia and was distinctive among the great river valley traditions of the third-millennium Bronze Age.[1] The great Harappan cities may not have been as large as the primate cities on the Euphrates, but they were built with the finest quality baked brick and with great skill in masonry;

they were often laid to a plan; and they had street drainage systems which few other third-millennium urban centres had. Flourishing between about 2600 and 1800 BC, the Harappan civilization had an impressive geographic spread in contrast to the Egyptian and Central Asian civilizations, for example. There is strong evidence of its seafaring reach and in this the Harappans could not be rivalled by the people of Mesopotamia, the Gulf, or Egypt, even though Harappan metal technology was comparatively rudimentary and the Harappans did not build grandiose pyramids as did the pharaohs of Egypt. In terms of the specifics of material culture, archaeologists can easily distinguish the seals of the Indus civilization from, say, contemporary Mesopotamian seals.

To continue with the rubric 'civilization', in archaeology this term signifies a stage of cultural development when metal and stone technology replaces reliance on stone and bone tools; when mud huts give way to multi-room dwellings, fortified enclosures, and grand residences at certain points on the landscape; when writing and monumental figurative art appear, and cities grow as political and economic nerve-centres. Further, in the stage we call civilization, diverse regional cultures are subsumed under a widespread style of material culture. Instead of a mosaic of various regional cultures we have similar archaeological assemblages spread across a large territory. Thus, what we will be dealing with first and foremost, is defined as an archaeological entity that was bounded in time and space. It is not some vaguely conceived 'source'—linguistic, religious, or technological—of our present culture.

The archaeological phenomena we identify as Harappan—baked brick houses, steatite seals carved in intaglios with high, pierced bosses, weights of a specific and uniform standard, long cylindrical carnelian beads, and sturdy red pottery in a set of recognizable shapes among other features—cease to appear in the archaeological record of the centuries between about 1900 and 1700 BC. Additionally, a very large percentage of Harappan villages and towns were deserted during or before that period, so that no vestiges of subsequent cultures are to be found at them. Thus a commonly drawn conclusion that ensues is that some

holocaust such as enormous and unusually high floods, or a dramatic shift in the course of the Indus, or rainfall change of high magnitude had occurred. Often the material excavated is reified and equated with 'a people' in the sense not of the people who created those material objects, but an ethnic group. When Harappan artefacts were first found in Gujarat, for example, it was thought that 'the Harappans' had migrated there as refugees. It was not realized that the presence of Harappan artefacts there could mean the extension of the Harappan socio-economic system—for example, the spread of a certain method/organization of pottery manufacture—to that region. What we call Harappan material culture is not the same thing, and cannot be coterminous with, a past ethnic identity or breeding population in the biological sense. Thus our primary concern is neither demography nor ethnicity.

This is why the discussion that follows will not give pride of place to natural calamities such as floods or to radical environmental change as forces behind the end of the civilization. Instead, I will briefly review the theories that have been advanced regarding the natural catastrophes that could have brought Harappan civilization to an end, and the aim will be to gain a perspective.

NOTE

1. The Bronze Age is defined as the period in which certain key tools of production—especially craft production—were made of copper or bronze.

1

Environment and Ecology

It is not surprising that we wonder about the environment in which the Harappan civilization existed: Harappan archaeology has many instances of animals being found where we would least expect them. One of the latest is the discovery of bones of the rhinoceros in a hollow near a large Harappan-period brick structure at Nausharo (Jarrige 1987-8: 187) in the arid Kacchi plain. On the basis of pollen identifications from twenty-two dated lake sediments in Rajasthan (Gurdip Singh 1979/1971; Bryson and Swain 1981) it has been suggested that there was substantially higher rainfall—monsoon as well as winter rainfall—between 3000 and 1800 BC, indicated by the pollen of moisture-dependent Artemisia and Pinus, and fresh-water demanding Typha grass occurring in substantial proportion in levels dated to that period. The pollen species frequencies, it was inferred, indicate that after the Harappan period there followed a period of marked aridity. Among the problems associated with this argument are: (1) the fact that evidence of pollen is not a direct measure of past rainfall changes but can only suggest that changes occurred (personal communication, V.N. Misra); (2) the fact that Gurdip Singh identified pollen and charcoal of cereal plants (indicating disturbance of the natural vegetation cover) for the period 7000 BC onwards when systematic surveys conducted in Rajasthan indicate that no agricultural site existed—not even one buried under sand dunes (V.N. Misra 1984); (3) the fact that rainfall fluctuations are not so precisely dated (see Pilcher 1993) that we can state with confidence that a dry period occurred in precisely the last century/decades of the Harappan period (in fact, Gurdip Singh found 1800 BC—now accepted by many as the terminal date or even as post-Harappan—to be a time of

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exceptionally heavy rainfall) and we do not always know the time-lag between climatic change and vegetation change; (4) that the pollen of different trees is differently dispersed; and (5) that what counts is the effect of a fall in precipitation. If precipitation fell, the effect would be more marked in Sind, which has only 20 cm or less per annum in rainfall, than in Ropar near Chandigarh, with 65-70 cm rainfall in the year. Similarly, the impact of change in rainfall patterns will also depend on the system of agriculture, for example on the extent of reliance on ground water. A more pertinent point has been made by B. Allchin (1994; also Bharadwaj 1961:152): what really would have mattered was shifts in either winter or monsoon rain-bearing winds, between which two belts lies Sind. The 1972 drought, for example, was associated with a south-eastward shift of wind and pressure belts (Krishnamurti and Kamitsu 1981).

Climatic change in the true sense is a world phenomenon. Rainfall regime fluctuations during the Bronze Age have been detected in other regions also, but no precise pattern can be identified. While Issar (1995) claims for the Levant a fall of annual precipitation between 2400 and 2000 BC, Weiss, Courty et al. (1993) find 2200 to 1900 BC the driest years in northern Mesopotamia and Syria. The last mentioned scholars do not explain adequately the micromorphological and other data on which their argument is based. The alleged collapse of 2200 BC is posited on a 'sudden' abandonment of settlements, itself questionable. Butzer (1976:26-38), meanwhile, finds evidence in Egypt for dessication and exceptionally low Nile floods, not only between 2250 and 1950 BC, but also between 3000 and 2800, in those very centuries when the Egyptian civilization was developing![1]

Egypt is a hyperarid land with less than 10 cm rainfall in the year today; lowering of rainfall by even a small margin would have made an appreciable impact on pastoral subsistence in the eastern and western deserts and on plant growth. Yet, the fall in precipitation around 2250 BC did not bring Egyptian civilization to an end even though incursions from Asia had also begun, and there was a political interregnum, known as the First Intermediate Period (2181-2040 BC). The character of kingship, the ideology of

death and the afterlife, the system of writing, and Egyptian technology endured. The hieroglyphic script and classical Egyptian language that took shape around 2600 BC, would flourish into the iron age in the first millennium BC, at which stage their usage became restricted to the religious and official spheres. The most eloquent testimony of cultural continuity was, however, the vibrant literary tradition. A popular piece of prose written in the time of the Old Kingdom (perhaps in the twenty-third century BC) was 'The Instructions of the Vizier Ptah-Hotep', containing more than thirty maxims delivered by a father to his son on how to get ahead in the world. Entire passages of this text are incorporated in the 'Instructions of Amen-em-Opet', who was a minor official during the Late Kingdom, a millennium later (Wilson 1963:91-2).

It is doubtful whether the eclipse of a civilizational set of traditions and their interrelationships can be explained by climatic change. We do not know how rapid the onset of aridity would have been in the relevant regions, and we have said that its impact would vary according to local conditions. Human societies like that of Egypt have often shown the capacity to adjust to or recover from adversity, and there are references in Egyptian literature to the utilization of grain stores and successful distribution of food in the affected nomes at such times.

This holds true even for the phenomenon of damaging river floods. Butzer (1967:27-33) found evidence of a series of catastrophic floods of the Nile, river levels say 2 m higher than average on the flood plain between 1840 and 1770 BC, but this period in Egypt saw robust administrative institutions being established, strong rulers, and trade with the eastern Mediterranean and with Nubia. The Egyptian evidence alerts us to the dangers of the reasoning of the sort epitomized in the Gujarati proverb *kagdanu besvun ane dalnu padvun* ('the alighting of the crow and the fall of the branch'): two phenomena that appear sequentially or contemporaneously in the archaeological sequence need not be in causal relationship to each other (see Watkins 1998).

The argument for floods in the Harappan case is that earthquakes (to which Sind is prone) could have pushed up the

ground so as to obstruct the flow of the Indus in its channel, as has occurred occasionally in later history. It was argued by Raikes (1965) and Dales (1979b/1966) that the waters of the Indus were thereby pushed back, created gigantic floods,[2] and engulfed Mohenjo-daro in mud. However, what they interpreted as water-laid mud or silt or silty-clay were, according to others, the mud platforms built to raise structures, and even wind-deposited material.

I will also make only a mention of Lambrick's argument (1979/1967) for major shifts in the channel of the Indus. These may well have occurred, but we can make out no pattern in the locations of early, Mature Harappan, and Late Harappan sites that can be read as adjustments to such shifts. So too, sea level change, also a global phenomenon, is known to have occurred. Worldwide rises in sea level (by about 2 m) are recorded for around 3000 BC—when low shorelines would have been submerged and rivers would have entered cycles of aggradation—as well as falls of about 2 m around 2200 BC, which latter can reflect dry periods with reduced flow in rivers (see Raikes 1979/1964; Butzer 1976:36). For Makran, Besenval (1992:105) records a fall of 5 to 7 m in sea level after about 2000 BC. At Sharjah, Bahrain and Kuwait, geomorphologists found that the sea level was above the present level until about 2000 BC, when it fell a little below the present level for a short period (Potts 1990:15-16). Hojlund and Andersen (1994:18-19) state that the city of Qala'at al Bahrain, founded in the latter half of the third millennium, was gradually extended northwards as the sea retreated. It remains, however, for us to investigate what the lowering/withdrawal of the sea meant for particular coastal settlements/economies, or for harbours where cargo boats would come to load or unload, or the repercussions, if any, on the depth of the subsoil water.[3]

My disinclination to dwell at length on natural disasters as 'cause' is also prompted by the argument that we cannot ignore a people's responsibility for a decline or disaster or loss of cultural values that they happened to face. Let us, for example, consider environmental degradation in place of climatic change. In many parts of the world existing plant growth does not represent the original vegetation; in some regions, the soil cover on hill slopes

has been irretrievably lost because of tree felling; some zones, today charaterized as steppe, have become so because centuries of animal herding and grazing caused the spread of xerophytic plants; and the ancient copper producing region of Sinai has copper even today but no plants to provide charcoal for smelting it (Whyte 1961:66-79). Intensive cultivation and irrigation that deplete the soil of its nutrients, nomadic invasions that convert agrarian tracts into pasture, political instability and impoverishment of peasants are other factors responsible for the desertion of settlements.

Walter Fairservis (1979/1967) made a pioneering study of the impact of Harappan land use on the countryside around Mohenjo-daro. He estimated the total population of the city at 41,250 and calculated the cereal needs of this population. On the basis of pre-modern rates of wheat output per acre in the region, he calculated the area that would have been under cultivation (22,715 acres) in the vicinity of Mohenjo-daro. Fairservis then went on to estimate the number of cattle needed for ploughing the fields, and then the total cattle population (at 8,700 or more). The grazing of so many animals, he suggested, would have made a 'formidable assault' on the local vegetation, triggering ecological crisis. It is possible that Fairservis underestimated the cattle energy requirements of agriculture:[4] he did not take into account lift irrigation and the use of cattle at wells and lakes to work levers or pulleys, as prevails even today in parts of Kutch and the Indus plains. Nevertheless, his remains an extremely important approach to the question of the relationship between a people and their land.[5] The whole problem merits fuller investigation as some Harappan settlements appear to have been large for their respective settings. Let us take Mohenjo-daro. Even if, at 125 ha, it had a population of 13,000 or slightly more, it would have been a larger city than Larkhana in the nineteenth century, whose population then was 10,643 (Hughes 1876:501 ff.). Again, Dholavira, above 50 ha in area, would have had a minimum population of 5,000, whereas in the previous decade its residents had numbered approximately 1,000, of whom about a third had been animal herders living there for only a part of the year.

Vegetation growth could have been harmed in another way.

Archaeologists have begun to appreciate the fact that ancient metallurgical industries consumed exceptional quantities of wood charcoal fuel, the only metallurgist's fuel in pre-industrial times.[6] It was estimated by Horne (1982:12) that for 20 small shaft-hole axes weighing together about 5 kg, some 100 kg of charcoal was burnt; 100 kg charcoal in turn means 700 kg of fresh wood, or the wood of 25 to 30 trees. (Iron smelting requires comparatively low charcoal expenditure.) Wertime (1983:357, following Weisgerber) observes that third-millennium metallurgy in Oman came to an end in about a century and a half, not because the ores ran out but because the charcoal sources were depleted. He also states that a full-grown pine tree gives 20 kg of charcoal, and 620 kg charcoal is needed to smelt a kilogram of copper ore.[7]

Significant evidence on this matter comes from Lothal. The site lies near the boundary between tropical thorn forest and tropical dry deciduous forest belts mapped by Champion and Seth (1968:48, 175, 182, 229); this boundary falls near the 75 cm isohyet. In the Mature Harappan levels II and III, at this site, the charcoal of diverse trees, representing species from a mixed dry deciduous forest cover, has been found. The trees include Acacias, teak, Albizzia, Lauraceae, *Soymida febrifuga*, and *Adina cordifolia*. But in the last Harappan level, stratum IV, the large quantity of charcoal found was only of the Acacia (Rao 1985:669). It is suggested in the excavation report that this species change indicates climatic dessication (ibid.:682), but a more straightforward explanation for the preponderance of the Acacia is 'biotic interference by man' (Fairservis 1967:82; also Whyte 1961:69) and the transformation of the local growth around Lothal to a dry thorn forest with hardier and more rapidly growing trees. We may recall that animal dung was used as fuel in a Period IV carnelian heating kiln at Lothal (Rao 1979:120; 1985:522-3). This was revealed by the analysis of an ash dump near the kiln. Was cow dung used because it is suitable for a kiln that needs to heat slowly at low temperature, or was it used because of a shortage of charcoal? A more enigmatic pattern was detected in the charcoal counts by Thiebault (1992) at pre-Harappan Mehrgarh: a relative fall in the ratio of tamarisk, among a total of ten tree species, between 5000 and 3000 BC, yielding place to legumes, but a relative rise in tamarisk thereafter.

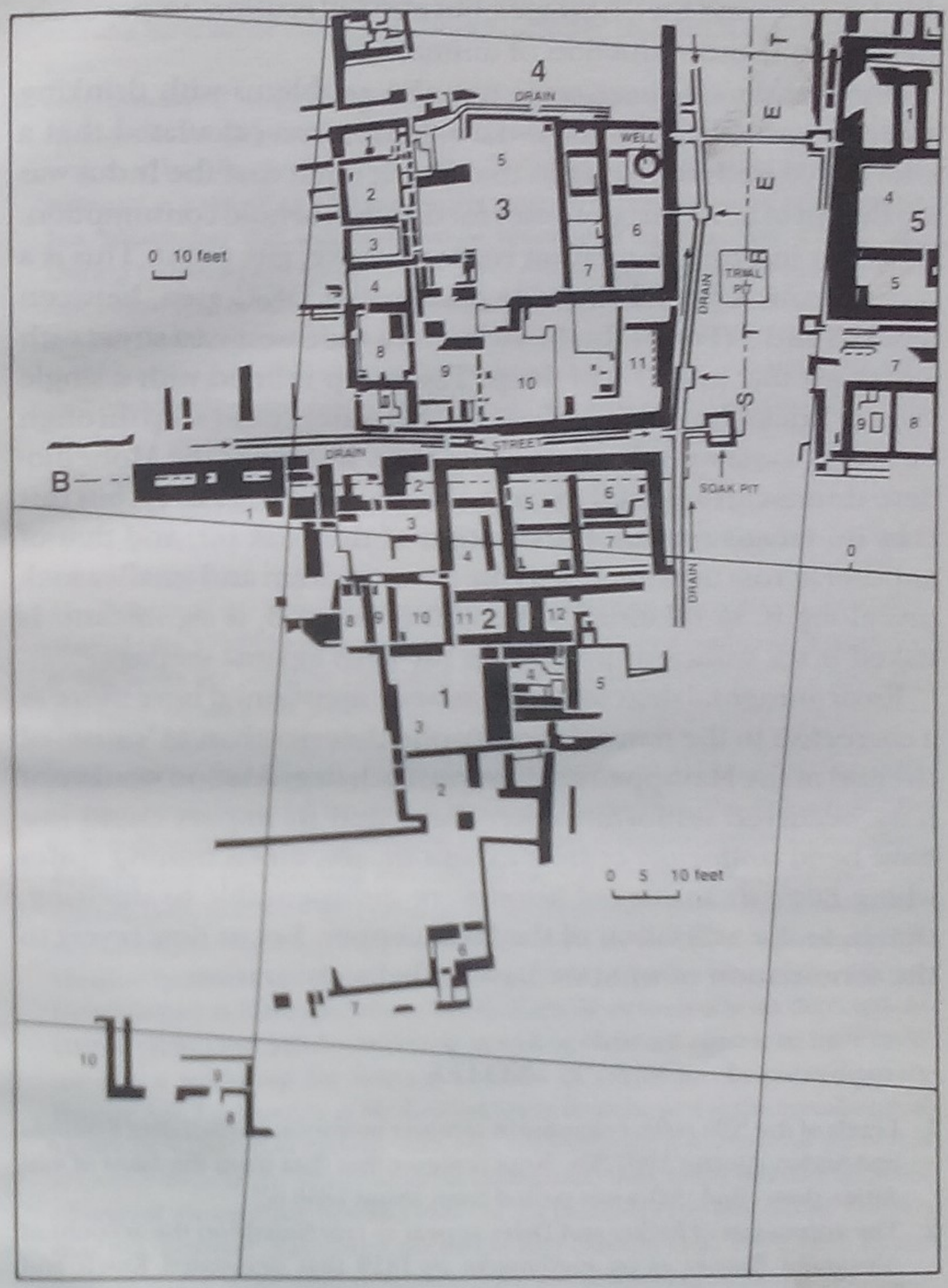

Figure 1. The DK-C area in Mohenjo-daro: the proximity of wells, soak pits and drains.

Deforestation brings in its wake not only changes in trees and shrub species and fuel shortages, but also soil erosion, impoverishment of soil, and reduction of animal life.

One wonders if there were not also problems with drinking water in towns like Mohenjo-daro. Jansen has calculated that a total of 700 wells were dug in that city: it is felt that the Indus was too distant to be a source of water for daily household consumption. Consider just one, somewhat representative, city point. This is a very narrow, 4 ft (1.2 m) wide lane in the DK-C area, between blocks 2 and 3 (Fig. 1). In the vicinity is a wide west-east street with a soak pit that goes 1.5 m deep. The sump is lined with a single layer of bricks, but not at its base, so that water could seep through but solid waste would collect at the base. If some of the Mohenjo-daro drains carried solid excreta (Marshall 1931:17 n. 1), but this is by no means certain, the location of this soak pit, and that of another across the street, plus the covered drain and smaller soak pits along it, in relation to the well in block 3, is significant. Is baked brick sufficient protection for wells against seepage?[8]

Environmental degradation has been mentioned here more as a corrective to the natural catastrophe theories than as 'cause' of the end of the Harappan civilization; such degradation would not have occurred uniformly everywhere and its impact could not have been uniformly critical except in, say, metal mining zones where large quantities of wood were indispensable to smelting, that is, to the utilization of the local copper. Let us now revert to the termination of what we have called a civilization.

NOTES

1. Levels of the Nile reflect changes in summer monsoon rainfall over Ethiopia and Sudan (Butzer 1967:30). Note however that data from the lakes of east Africa show (ibid.:32) a wet period from about 1850 BC!
2. The arguments of Raikes and Dales appear to rely heavily on the account of Alexander Burnes of an earthquake in 1819 that devastated Kutch and interrupted the flow of the Indus. In the lower Indus valley (Burnes 1973/1834:313-19) a wide and ten-foot high bund was thrown up, which blocked the Indus but which burst open when, in 1826, a huge flood occurred that restored the flow in the Indus and its Eastern Nara branch. Burnes writes that the 'lake' that had been created was deep enough for boats to sail in and that it was '2000 square miles' in area. Burnes arrived in Sind in 1830 and could not have seen the gigantic lake for himself; he only examined vestiges of the bund. And he does not indicate that this seven-year catastrophe destroyed existing agrarian or cultural traditions, or killed thousands of people in the area.
3. One wonders if archaeologists have grasped what qualifies as evidence for changes in the depth of the aquifer. Weisgerber (1983:270) had reported a well at a late third-millennium site in Oman, 14.2 m deep. It had been widened at a depth of 13.2 m, exactly where the present water table stands. For Weisgerber this was evidence of absence of change. But others (see During Caspers 1989:13-14) asked if the deepening of another well and this one below 13.2 m did not indicate that the water table *did* fall. Well levels are not necessarily those of the water table; they can be higher because of recent rainfall or seepage/percolation in the immediate vicinity. The widening of a well could reflect that rain or seepage was not recharging it, and an attempt was being made to create a kind of reservoir of subsoil water in the well. Or else, the sides of a well may begin to crumble because of the local rock formation, and widening could be a measure to save the bottom of the well. I am grateful to Samir Banerjee, Fellow, IIAS, for explaining these principles to me.
4. The Report of the Royal Commission on Agriculture (Bombay: Govt. Press) of 1928 (pp. 175-97) estimates that 195 acres of free grazing land are required if 100 acres are sown in Sind and that 53 working cattle are required for 100 acres of net sown area. This is a much higher figure than that given by the same source for Egypt.
5. Although Le Roy Ladurie (1972) is concerned with the impact of climatic change on agricultural harvests in western Europe, he is also aware (pp. 294-6) that drought may only be a precipitating factor if extensive land clearance, deforestation, erosion, and lowering of the water table have occurred.
6. Kurush Dalal first drew my attention to the large-scale use of crop straw as fuel at chalcolithic Balathal, and I have since been alerted to this possibility. R. Meadow (personal communication, March 1998), however, found no evidence for straw fuel at Harappa, where wood charcoal alone has been detected. At Lothal (Rao 1985:522-3) cow-dung as well as charcoal appear to have been used in a workshop for heating nodules of carnelian. In contemporary Bronze Age Turkmenia, at Shahr-i Sokhta in Seistan, and at the metallurgical centre of Shahdad in eastern Iran, too, the evidence is of charcoal fuels. It is at Gonur-depe in the Murghab delta (Margiana) that, along with the charcoal of saxsaul, sheep dung fuel and stalks of the mustard crop also occur. The last may not, however, have been burned as fuel (Moore et al. 1994:422). In any case, charcoal is the most suitable fuel for metal workers because it produces the requisite amounts of carbon monoxide as it burns.
7. Erach Bharucha told me (December 1998) of a case in the Mulshi taluka in which residents reported a *thinner* forest in the past than today. After the government banned charcoal kilns in the area in the 1960s, marked regeneration (albeit secondary growth) has occurred.

8. So far there is no report that levels of wells fell during the occupation of Mohenjo-daro. This had happened in ancient Athens. Here (Camp 1986: 33 ff.) wells in and around the agora were, in the fourth century, replaced as the source of drinking water by about 140 rainwater cisterns (plus piped water from natural springs to fountain houses), because the water table had fallen, and by about 350 BC was too low to be drawn up through wells.

2

What was it that Came to an End?

Although as archaeologists we recognize cross-regional similarities in material remains as one of the marks of civilization, this does not imply cultural homogeneity in an absolute sense. In this analysis I will, taking up on an idea of S.C. Malik (1968:87 ff.), consider the (wide) distribution of typically Harappan assemblages as explained not by the physical spread of 'a people', but by the extension of a set of socio-cultural institutions, practices and ideas, and an economic system, amongst several groups. Such institutions made for the assimilation or integration of different groups and cultures. Thus people of diverse areas and communities organized at diverse levels became incorporated into the Harappan political economy. In the language of Robert Redfield (1960; 1968/1953), a Great Tradition had engulfed multiple small tribal cómmunities. In the prehistoric past the latter would have been more or less self-sufficient villages, unified by the morality and obligations of kinship, of sharing the earth's resources, and the obligation to labour together, give mutual support, and be generous to those related by blood or marriage.

I have argued elsewhere (Ratnagar 1991) that such communities were incorporated into a society organized as a state with newly-emerged ruling elites using coercion or compulsion, but having few political institutions yet at their command, and thus having to forge social ties with subject groups in the idiom of kinship. The Bronze Age state, the very first kind of state, lacked a bureaucratic structure just as it also functioned without standing armies or a land tax system, aspects we associate with later states such as the Mauryan. In the Bronze Age the political power of the elite did

not rest on land-ownership, but on the right and the power to put the populace to labour—on the construction of city walls or buildings, in craft workshops, or on the land.[1]

In this new kind of social situation, while much of the solidarity and the idiom of kinship survived, Redfield states (1968/1953:45), there was 'institutionalized provision for the stranger'. Much continued as before in the villages, but there were now also exchanges with the towns and exposure to the demands of the ruling elite for military affairs or labour service; there were new craft items abroad, new tastes and consumption patterns evinced in the lifestyles of the elite, and new artistic and intellectual norms. Constituent communities ranged, in a 'folk-urban continuum', between the tribal village, the peasant village, the defensive outpost, and the culturally diverse city. Integral to this social formation was the social division of labour, especially manifest in the city where people interacted less as kin than as people dependent on one another for goods or services. People came to have many more interactions—albeit momentary—with others, and to play a greater number of roles in society. This in itself entailed the advent of new phenomena like public buildings and public utilities, high-built citadels for elite activity/residence/defence; new mechanisms for communication with non-kin; and methods of recording and accounting, the last entailing the use of writing, one of the most momentous of human inventions. Seals were devised as marks of identity and authority in this world in which exchanges were not always with known persons, and generally of an impersonal nature. Civilizations incorporate diverse ethnic identities and multiple language groups, and the diverse groups are potential adversaries. For even as culture integrates, in giving a group its distinctiveness it also separates (Tokarev 1977:168). Specific religious practices, art styles and languages incorporate members into groups but equally exclude others. The early state, however, represents a fledgling 'civic society', in which people had to develop skills of communication and to learn to respect—if not clasp to the bosom—the outsider/stranger, and guarantee him safety and basic amenities.

Therefore the interesting facet of civilizations is not only their political domination and compulsion, their dependence on the

city for cult services or exotic goods or craft items or the settlement of disputes, but also how the constituents were held together by diverse and multiple threads. We are impelled to explore the collectivities, the institutions of social integration (see Eisenstadt 1988), and the interrelationships that gave this Great Tradition its coherence. Did tribal values, surviving in the face of newly developed institutions of royal coercion, for example, create conflicts of loyalty? Were there conflicts between opportunities for personal political advancement and the demands of the natal clan or tribe? We know (Wolf 1966) that states in many spheres yield sovereignty to other institutions or networks such as patron-client relationships or kinship bonds, which 'function in their entrails' to manage matters that states cannot, like settling internal conflict, or managing irrigation at the local level. For Kaufman (1988), political dissolution is the essential component of civilizational collapse.[2]

The theory of the early state incorporates also an understanding of its in-built instabilities (see Redfield 1968/1953:56-9). State structures and power relationships are 'volatile' (Adams 1988:30) and conflict is inherent (Eisenstadt 1988:240-2). The emergence of the state and the assertion of territorial boundaries can cause migration or resettlement of groups; there are invariably dis-inherited and relocated people, such as vanquished enemies and repeatedly-raided frontier peoples, and, quite significantly, even uprooted craftsmen. It could be argued that the grid plan settlement which characterizes Harappan urbanism is specific to new or re-located towns, or towns laid out afresh, that could not have grown out of old village origins.

Thus collapse means the end of an integrated and complex social, economic and political system, carrying with it a decline in social stratification, erosion of economic specialization, the eclipse of regulatory institutions and the flow of information, the city life that embodies the sophistication of the civilization, and, ultimately, what Tainter (1988:4 ff.) calls the epiphenomena: the magnificent monuments and art production (Pl. 1). Paradoxically, it is often these 'epiphenomena' by which ancient civilizations are known to us, and it is their disappearance in the archaeological record which is equated with civilizational collapse.

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The reader may have noticed that this approach differs from that of Malik (1968) and Possehl (1979, 1997), who emphasize the survival of Harappan traditions (disconnected ones, it may be noted), such as the bullock carts, the binary-decimal system of mensuration, written signs, and the scored goblet or *kulladh*. Possehl doubts that stratigraphic dead ends (the termination of a certain kind of material culture in the vertical sequence of a site) mean the end of tradition: a state it was that died, he argued in 1979, not the Harappan civilization or its pottery and other material constituents. In contrast, my argument, in spite of dismissing demographic collapse, is that the civilization did indeed come to an end. Certainly some pottery forms, oral traditions, village cults, and the rural sciences of land use entailing knowledge of seed types, animal behaviour, and climatic conditions, did not go into oblivion. But however many such elements we count as 'survivals', they are not tantamount to an integrated Bronze Age political economy.

Let us then consider what the civilizational collapse entailed.

NOTES

1. For Tainter, who analyses collapses of ancient civilizations, the entities concerned were 'complex societies' with inequality, heterogeneity, unequal access to resources, and emergent class stratification.
2. Perhaps it is the absence, in Kohl's argument (1987), of any discussion of the state in Bronze-Age southern Turkmenia that leads to a marked contradiction between his insistence on the absence of collapse (p. 19) and his discussion of large-scale migration and settlement shifts to Margiana, new burial customs, changes in metallurgical output, and the shrinking of Altyn-depe to a fraction of its former size. Kohl does not define the social phenomenon that 'did not collapse'; I would suggest that a failure to construct the problem suitably at the outset is what can lead to such an anomaly.

3

Harappan Settlements: Terminal Occupations and Abandonments

The most striking aspect of the end is the desertion of the largest Harappan urban centres, and a majority of the smaller settlements. At the five largest settlements, Mohenjo-daro, Harappa, Ganweriwala, Dholavira, and Rakhi Garhi, there are no vestiges of post-Harappan occupation (except for Cemetery H at Harappa, to be discussed below). Of 132 Harappan settlements[1] on which I have been able to acquire information, 101 were deserted.

Village or town abandonment is not in itself particularly mysterious. It has occurred often in history, because of repeated droughts in a region, or village epidemics, destruction of houses by flood, the wearing out of soil fertility, or the promise of better land elsewhere. In our case it is the scale of desertion and its permanence (not desertions for a few years until recovery) that are significant. We do not, however, know over what length of time the various Harappan cities and villages were abandoned.

During the lifespan of a town or village some of its houses may be emptied of occupants, even as life in the settlement continues; it can happen that people move out of a settlement in stages, over decades; or else an abandonment can occur all at once. Gradual, piece-meal shrinkage is what Beach (1988:60 ff.) suggests for the imposing Shona capital, Great Zimbabwe. He argues that it had more than one royal enclosure, each built in a different period, for rulers, their sons, and their affinal kin. After AD 1450 the great centre became the target of raids and people gradually moved away. The power of the rulers declined and several rebel factions left. Ultimately, so did members of the last ruling house, until

(ibid.:60) 'finally and figuratively, the last inhabitant expired next to the grave of the second-last inhabitant'. The problem is that archaeologists have few devices to distinguish one mode of moving out from another (see Cameron and Tonka 1993). We only have some clues to go by, no hard-and-fast criteria, no 'laws of the archaeological record of abandonment'.[2] The same difficulty arises with the circumstances of site abandonment. As W. Adams (1968:208) has pointed out, in house repair there is no gentle way of removing a wall—it has literally to be knocked down. And an excavator may mistake this for an act of violence.

When evacuating a village or town people will, if they have the time, salvage roof logs, grinding stones, portable pottery, food grain, and other useful items, to carry away (Cameron 1993:3). Some rooms or houses will have lain unused for a while, piled with discarded things, before departure, or, as at Altyn-depe, be used as burial places (Masson 1988a:37). People may pull out house posts, and sometimes postholes contain telltale pebbles or sherds which show that the wood of the posts did not decay *in situ* (Brooks 1993:185). Very few items of utility or cultural value will be left behind. For example, we will not find grain in the storage jars or silos, or uncast metal ingots on the floor of the workshop, or icons at the hearth. A good example is the Akkad period palace at Tell Brak in Syria, which was a storehouse and administrative centre with a large ceremonial unit and a temple. It was abandoned after about 2200 BC. Its contents were removed, and then offerings were placed within, followed by a ritual filling in of the rooms (Oates and Oates 1994:171-2).

In contrast, hurried departures during times of violence may be indicated by

(a) burnt buildings with their fixtures and appointments during use still in place, though charred or broken. Items that were to be baked may remain stacked near a kiln that was never lit, as at Ugarit (Drower 1968). The tip of a spearhead may be found embedded in a piece of wood (Shahr-i Sokhta). A child's charred skeleton may be found clutching some object and lying under fallen roof logs (Shahr-i Sokhta, Tosi 1983:88).
(b) jars set in floors can be seen to have broken there, so that they can be reconstructed from their pieces. The sherds on the floor of a hurriedly abandoned room will tend to give the parts of entire pots that were in use in that structure (Godin Tepe, Weiss and Young 1975)
(c) walls with signs of recent repair or plaster
(d) craft items left half finished at the place of manufacture as at Ugarit (Drower 1968)
(e) valuables or culturally significant items, of no use to the destroyers or to subsequent squatters, used in ways never intended. After destroying Ugarit its pillagers used some clay tablets inscribed with religious texts to support shanty walls (ibid.). At Dholavira a vandalized stone statue came to support a wall.
(f) valuables or culturally significant items like religious emblems or statuary or rulers' inscriptions smashed or defaced
(g) the dead hurriedly buried in non-customary spots or ways
(h) safely or secretly deposited wealth items left behind in the rush to flee the enemy. That these were secreted wealth and not votive offerings or ritual building foundation placements will be indicated by disturbed floor paving.
(i) W. Adams (1968) points out that evidence of burning is not by itself proof of attack or invasion. Residents may burn down houses because of vermin or disease. But in a kind of classic instance of attack, at Tepe Hissar in north-eastern Iran (a settlement which will be of relevance to our argument) we find several signs, such as burned and charred walls, recently renewed plaster, charred roofing material, a post-hole with charred wood remains, a number of flint arrowheads in the vicinity of the building, metal weapons, and crushed skeletal remains. There were also spills of charred wheat and a storage room with fifteen large pots crushed by roof collapse (Schmidt 1937:155-71). This burned building at Hissar presents an archaeological situation in total contrast to the evacuated palace at Tell Brak. Most situations, however, fall somewhere between these extremes.

Quick abandonments, but without violence or destruction, may be indicated by

(a) grain remaining in storage jars or silos
(b) charcoal remaining in fireplaces

(c) half-finished craft work, associated tools and raw materials remaining in workshop areas
(d) the pottery (broken or intact) recovered in individual households representing the entire range required for domestic use
(e) clean-swept house floors and courtyards
(f) the figurine or emblem of a family deity in its place in the home
(g) thick (say 30 cm) layers of roof collapse on disused floors showing that roofs were not salvaged and subsequently fell in (Schlanger and Wilshusen 1993:92-3)
(h) buried wealth left unretrieved (?)
(i) usable items left behind, these being obviously not part of the day-to-day refuse of a family.

MOHENJO-DARO

With these clues in mind we can take up the Harappan evidence. We begin with Mohenjo-daro, probably the nerve centre of the civilization, judging from its size, architecture, exotic materials, and range of artefacts. As is almost invariably the case, the uppermost strata of a mound, in which we would seek clues for the nature of the abandonment, are the worst preserved. The remains of buildings that have been abandoned and exposed to the elements for centuries crumble into incomprehensible patterns. It can also happen that, over the centuries, following the death of a city, people of the surrounding region come in to take away bricks or stones for use elsewhere. In South Asia we have long dry months which mean exposure to the sun and wind, followed by rainy months when crumbled particles get washed away. Year after year the finer particles of soil can get swept away by wind and heavier material, such as broken bricks and pottery pieces, settle to form a kind of cap over the top of the mound. Rain, in its turn, can wash away floors or artefacts and re-deposit material at the bases of slopes, often in reverse order of their original vertical sequence. In later centuries visitors may dig pits into the mound and leave the artefacts in an order which has nothing to do with their positions during the last occupation of

the settlement. Moreover, when excavation begins at a site, archaeologists are not immediately attuned to the peculiarities of the mound, and interpretation of the levels is not attempted until a stratified sequence begins to be recognized in the trench sections below the layer labelled 'topsoil'.

Marshall and Mackay named the terminal level at Mohenjo-daro 'Late I'.[3] Marshall (1931:9) claimed to have discovered a discontinuity in the Mohenjo-daro sequence that appeared to indicate that 'the city had been reduced to ruin' between the Intermediate I and Late III phases. On his part Mackay (1938:xiv-xvi) saw in the northern residential area, DK, a great flood deposit between Intermediate III and Intermediate II levels. Later excavators found no interruptions in the sequence and we have seen that mud platforms were often mistaken for water-laid deposits. Nevertheless, we may bear in mind the possibility of interrupted occupation or re-building and re-occupation in some sectors of Mohenjo-daro. Dales and Kenoyer (1986:484-5), reporting on their excavations in the 1960s, noted that they found the uppermost strata in the south-western corner of the HR mound had virtually no structures. A great amount of erosion had occurred after the Harappan desertion and before Buddhist activity began there (see Marshall 1931:179). Wheeler's 1950 excavations on the citadel mound had identified four phases with no interruptions, 'D' being the last phase, with mainly ruins and building debris. Phase C below had seen some alterations in the citadel fortifications (Alcock 1986:502-3).

What Marshall and Mackay had found was that, well below the final occupation stratum, Late period houses showed marked differences from the earlier ones. Those built now had entrances differently placed, with old doorways blocked (Mackay 1938:31ff.; Marshall 1931:180). Houses in DK-G had been partitioned, as if families were splitting (Mackay 1938:6); this meant, for example, that a well in a large residential structure was now directly accessible to only one of the family subdivisions (ibid.:54 ff.). An entrance could be narrowed down from a width of 1.2 m to less than 60 cm or 2 ft (ibid.). Clear signs of decay are apparent in the fact that walls are now thin, perhaps no longer bearing the weight of upper storeys (Marshall 1931:233-9), with odd-sized bricks laid

in the most haphazard of ways (ibid.). The huge residential building or 'Palace' of DK-G area was, in the Late I and II phases, not only subdivided but this locality was transformed into an artisans' quarter (ibid.:6, 54 ff.). Meanwhile, on the citadel, the Pillared Hall (Pl. 2) of the Intermediate period, a beautifully paved structure for which five courses of baked brick, most accurately cut and set, had been used, was in the Late period partitioned by rough brick walls and utilized at least in part for *shankh* shell cutting work.

An intriguing indicator of social change is the appearance of the scored goblet (Fig. 2) in Late levels in Mohenjo-daro (and Harappa, Dales and Kenoyer 1986:126 ff.). These were carelessly turned on the wheel, their height say 7 to 10 cm, with a pointed base. They were not meant to be stood upright on floors or shelves when full. The deep scoring around the shoulder shows that such pots were to be tied with string in order to be carried around. Scholars have remarked on the similarity of these 'goblets' to the present-day *kulladh*, but I cannot believe that their original purpose was at all similar. The scored goblet is practically the only Harappan pot form to carry—though only occasionally—seal impressions; these were made when the pot was still wet, so that some official purpose is indicated. Mass-produced on the wheel

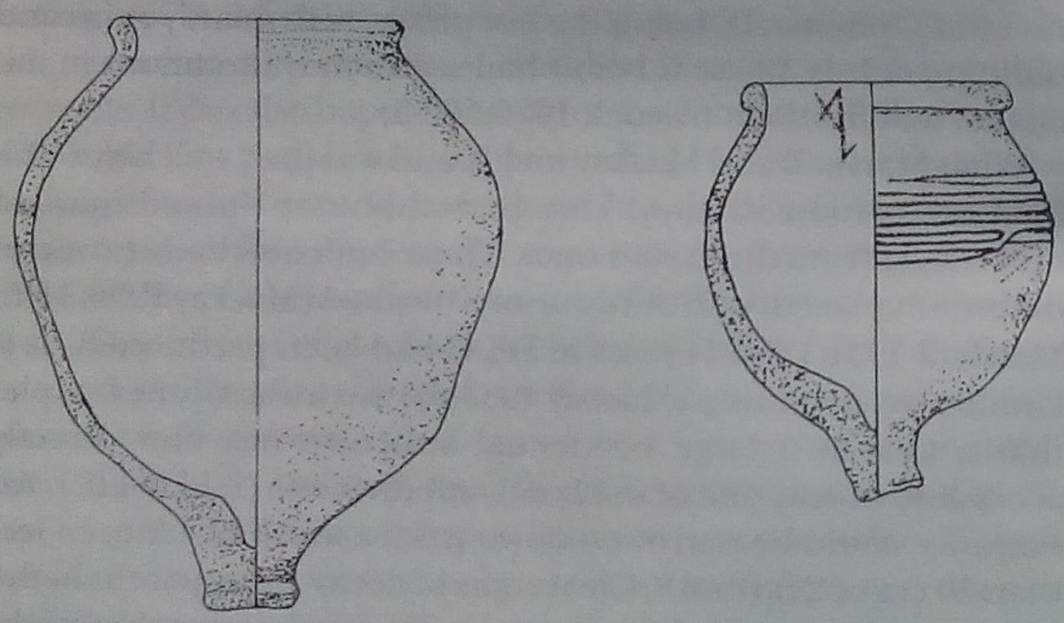

Figure 2. Scored goblets.

and fired in stacks, such pots could not have been containers for individual offerings from the populace to the gods. Perhaps some measured item (the seal impressions can carry inscriptions which include numerals)—emergency grain rations for example[4]—was handed out to the populace in these containers. Hence their occurrence in very large numbers, plus the fact that they seem to occur in a restricted size range. Although present in large numbers at cities like Harappa and Mohenjo-daro, and known at Amri, they are practically absent in towns like Lothal (Rao 1985:339) and Shortughai.

The excavators found that at Mohenjo-daro these goblets occurred in clusters, say near wells, rather than singly, and had suggested that they were drinking vessels; but there would have been no need to make water cups on the wheel in a standard size, much less impress them with seals. Perhaps this was a secondary use found for the vessels. Re-use, in turn, would indicate that the original substance put in them was something dry. An analysis of the size range of these vessels, that is, of their capacity in terms of grain or flour, and whether that would suffice for a day's food for one person, would throw light on the subject.

We have therefore been alerted to the possibility that city life at Mohenjo-daro was not as good in the Late period as it had been earlier, at least not in the public realm. Let us now move on to the abandonment itself.

Mention has been made above of the evidence for the dismantling of structures in the general process of settlement evacuation. House V in HR-B, Block 2, provides some interesting pointers (Fig. 3). (As we shall see, 14 skeletons were found in this Late period house.) It has a large courtyard, no. 70, with 5 short walls of decreasing length perpendicular to a rear wall. In room 49 were found, together with two limestone pillar capitals, a dump of eighteen large alabaster rings, each about 25 cm high, and polished smooth (Fig. 4). They had internal cavities in their centres, of about 11 to 23 cm in diameter, and thus could have supported wooden posts. They appear, therefore, to have been some kind of architectural element. (This kind of artefact, to my knowledge, occurs only in the large cities, Harappa, Mohenjo-daro and Dholavira.) But obviously room 49 was not the place

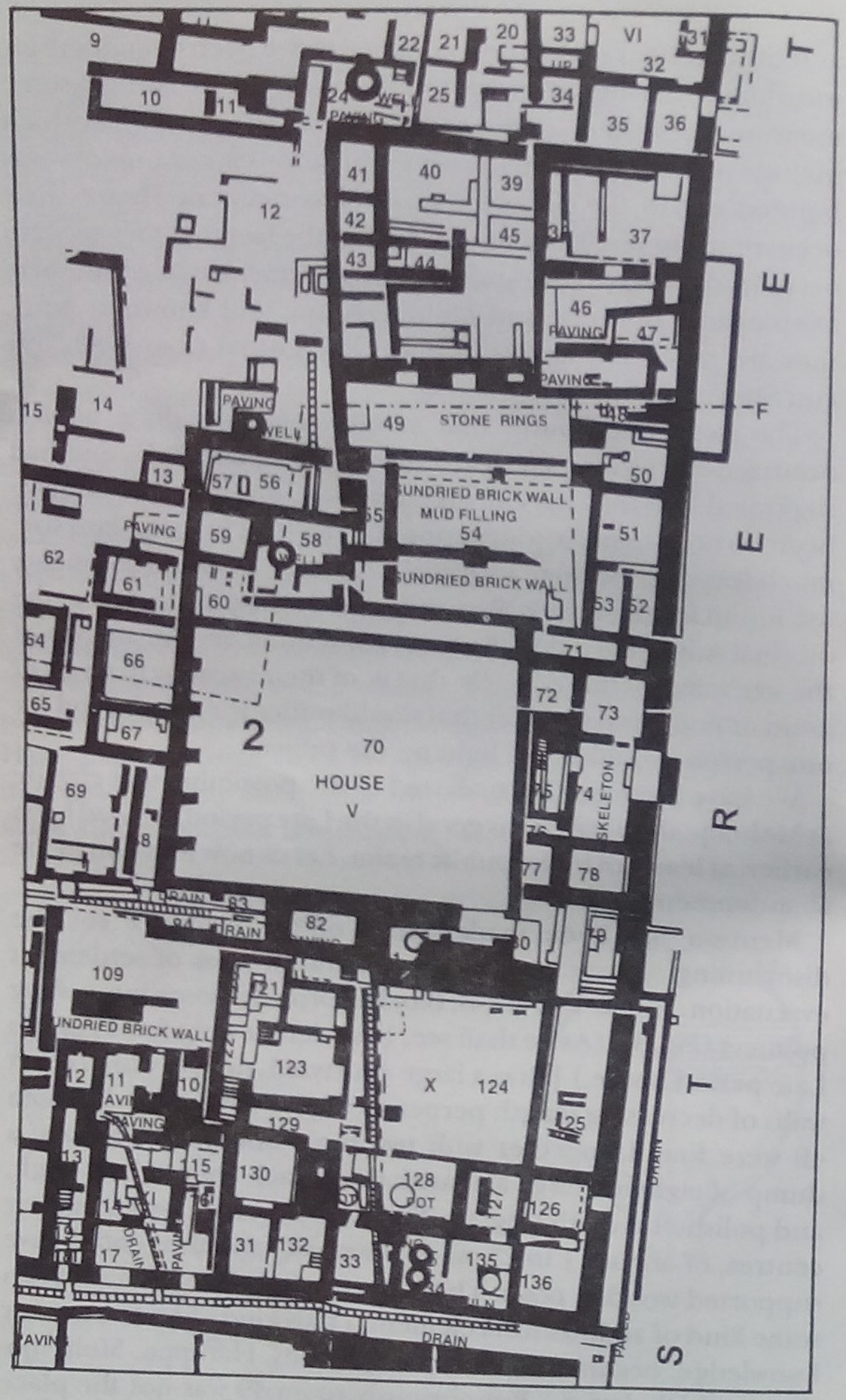

Figure 3. HR-B area in Mohenjo-daro: House V.

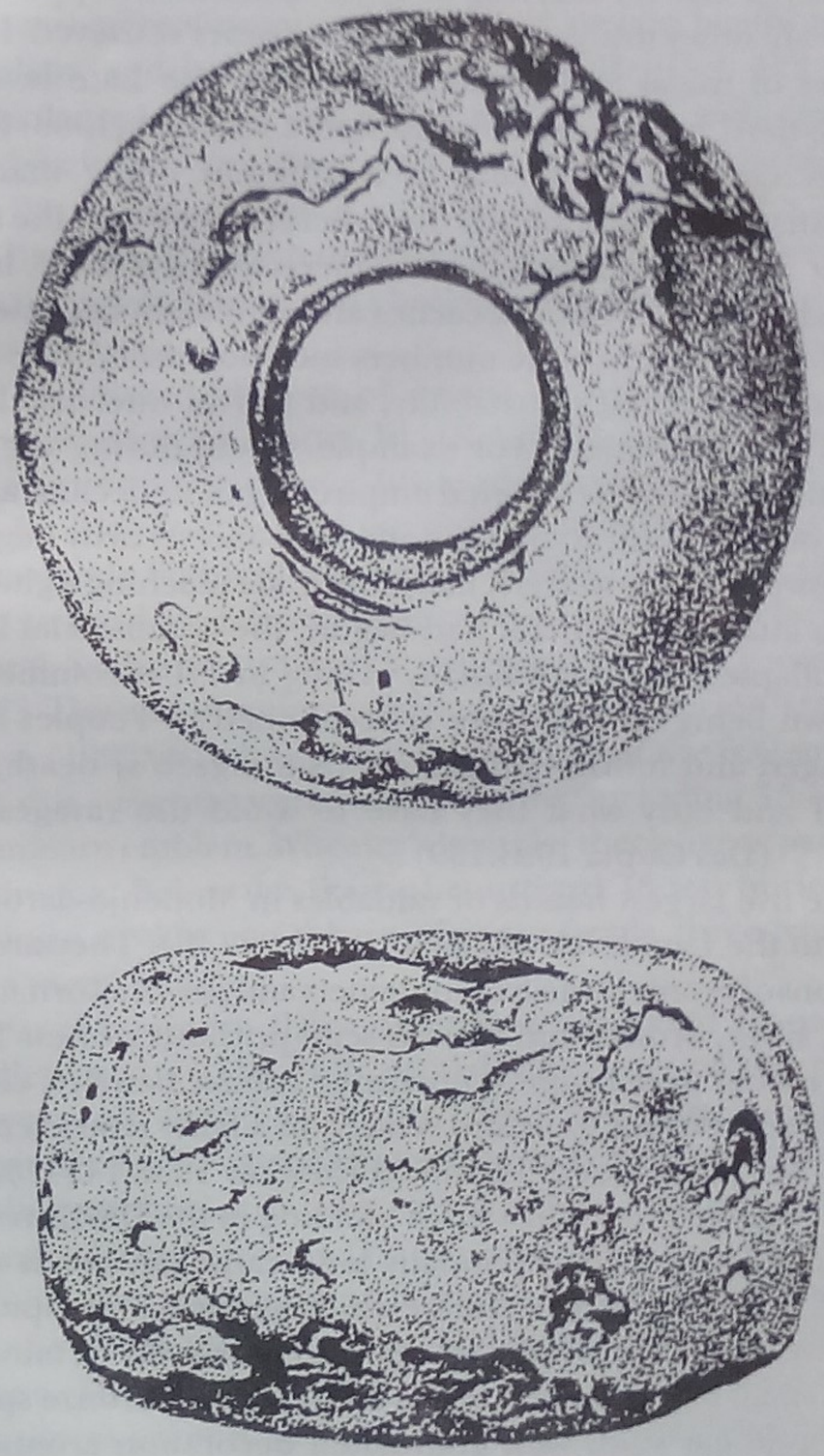

Figure 4. Pillar support from a room in House V, HR-B.

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where any such columns had originally stood. The heavy rings could have been gathered here with the intention of re-use elsewhere, or else for carrying away—which never happened.

There are other things, too, which were never retrieved. I refer to caches of metal and jewellery found in the Late levels of Mohenjo-daro, hidden under house floors. Rissman (1988) found that they contained artefacts of a different range than did Harappan graves. He contrasts their secret nature with the social or public act of burying particular objects with the dead. In our context, however, the house caches are significant because they speak of insecurity. In large numbers such hoards indicate times of uncertainty, political instability, and fear of internal clashes or raids on a settlement. For example, when, during the early eighteenth century the Mughal empire began to decline and its systems of communication, tax collection and security began to break down, with the westerly maritime trade reaching a glut, and Maratha attacks on Gujarat had begun, the commercial life of Surat collapsed. An Englishman, writing in 1701, commented: 'The town being bare of silver is occasioned by Peoples feares of the aged and infirme Emperor's [Aurangzeb's] death; they abscond and bury what they have to avoid the ravages they dread . . .' (Das Gupta 1994:139).

Of the five largest hoards of valuables in Mohenjo-daro, four belong to the Late levels (Rissman 1988:222 ff.). They are rich collections of bronze and silver containers and personal ornaments of gold, silver, bronze and various semi-precious stones. Three smaller caches were found (containing bronze bangles, chisels, figurines and various tools and vessels) in a fairly restricted area of DK-G North, in Blocks 14 and 15 (Mackay 1938:142 ff.). One of the richest hoards lay in a small building in the DK-E area and is remarkable for its exceptionally long carnelian beads (each about 12 cm long, and to perforate which highly skilled lapidaries must have been employed), strung with D-shaped terminals of bronze, small round bronze beads and six-holed bronze spacers (Pl. 3); gold ear studs with granulated decoration around the edge; and two large gold needles (up to 6 cm long) with eyes in their pointed ends—for either tapestry work or wearing in the hair (Marshall 1931:251 ff.). Many more pieces of silver and gold jewellery occurred in this treasure.

In Plate 4 is shown a gold bead bracelet with spacers and terminals from another hoard in a large, ten- to twelve-room house (no. VIII) in HR-B area, Block 2. It occurred with two silver vases and a great number of gold and steatite beads, plus jade, carnelian, and lapis lazuli (Marshall 1931:193-4, 522 ff.). The barrel-shaped jade beads, about 2.5 cm long, with disc-shaped gold beads between them and agate-jasper pendants hanging from the necklace on gold wire, come from a hoard in the DK-C area, Block 15-16 (Marshall 1931:250) together with silver earrings, rings and twisted strips, and a hollow conical cap of gold, probably a hair ornament.

An additional glimpse of drama is provided by a number of vandalized stone statues. In HR-A Block 1 was a house (no. 1) with a large courtyard (no. 10) in which a tree guard still stands (Fig. 5). This feature and the double entrance (albeit narrow) and two wide flights of steps made Wheeler think of a temple. In the courtyard were found faience and alabaster artefacts as well as a seal. Seals also occurred in courtyard 18 and in rooms 8-9, 21, and 23. This was, therefore, obviously a wealthy person's residence: Jansen (1993:68) reports that 98 per cent of the 600 small finds from this structure were prestige items, including 15 seals with the unicorn emblem. Wheeler's 'temple' theory is not particularly convincing. Below the floor of courtyard 18 was buried a man wearing a necklace of thirteen faience beads, three ivory beads, and a metal pendant.

Near the western flight of steps in courtyard 10 occurred a headless statue (HR 163) of alabaster; part of the head was subsequently found in South Lane; and four days later the remainder of the statue showed up in courtyard 34 in another building to the north. The extant height of this reconstructed portrait of a seated male (Pl. 5) is about 42 cm.

Stone statuary is rare at Harappan sites. When it occurs, it portrays either men or pedestalled figures of animals, but never women. The style is always formal and formulaic; about a dozen such pieces occur in Mohenjo-daro, one at Dholavira, and to my knowledge none elsewhere. Most, if not all, the statues were desecrated (broken) in antiquity. In fact another head (HR 910), in limestone and with the hair and features exceptionally schematically rendered, lay in room 14 of the HR-A house I, but

Figure 5. HR-A area in Mohenjo-daro: House 1 and vicinity.

there is no stratigraphic connexion between the two (Ardeleanu-Jansen 1984:146).

I have been tempted to infer that these are portraits of a royal lineage, because of their material, rarity, and formal or monumental style. We have as yet found no temples that would indicate that idols of deities were made. There could have been a rebellion or a major dynastic upheaval, during which the royal portraits were viciously demolished. (Consider also the 'Priest King' and the damage to its torso, face and arms (Pl. 6). The head dress, falling in two strands down the back of the head, is like that of the reconstructed seated statue from HR-A found in House I. The 'Priest King' statue had fallen, together with a wall, into a narrow passage in a shoddily built, Late period, quarter of the DK-B area (Marshall 1931:236 ff.)).

Even those who doubt that these stone sculptures carry political significance would at least concede a religious or symbolic significance to the four stone figures of seated animals (Pl. 7) from different parts of Mohenjo-daro, and the fact that these, too, were vandalized in antiquity and none was found in its original context. A couple of these were monolithic, the animal carved one with the rectangular pedestal below. The use of stone, the 10-cm high pedestals, the extant height (about 25 cm), the bent left hindleg hidden beneath the haunches, and the weird ridged 'trunk' of one of the animals point to a ritual or highly symbolic context (Ardeleanu-Jansen 1987).

The impression we gain of intense enmity and hatred abroad becomes relevant when we consider the controversial skeletons left behind in Mohenjo-daro. No cemetery has been found at this site, such as at Harappa, Surkotada, Kalibangan or Lothal, but it is reasonable to assert that in the Harappan region a regular mode of disposal of the dead was burial in cemeteries, or sometimes fractional burial of cremated remains under house floors (Marshall 1931:82-9). Intramural burial in the habitation area is, in the Harappan context, a freak occurrence and practically confined to Mohenjo-daro, with one exception at Harappa.

At school we were brought up on the skeletons in the Mohenjo-daro streets, under house floors, and in well rooms. For Wheeler they became evidence of the invasion [*sic*] of the Aryans. In 1961

Dales had, however, sounded a caution. Dales argued that such skeletons were too few in number to amount to what Wheeler had called a massacre by the Aryans. There were no burials in the citadel, Dales pointed out, where we would expect the last defence of the city to have been conducted. And the skeletons do not all date to the same stratum or phase in the life of the city. Kennedy (1982:291), in his inimitable style, reported that two of the skulls did carry marks of injury, but that 'the recipients of thumps on the head had survived this outrage by several months'.

One cannot argue with this, but I would urge that we do not throw out the political significance of these skeletons just because the Aryan connexion is dubious. The fact that they do not amount to a massacre does not rule out conflict, strife, or raids on the city in the last days of its occupation. Let us survey the evidence.

In the famous Deadman Lane in HR-A, Block 1, which is a narrow lane about 1.5 m across, and turns west into First Street, a major thoroughfare, lay the partial remains of an adult male (Marshall 1931:178 ff.).

In the VS area, house XVIII appears to have been a building of some importance, yielding some finely painted pottery and a few seals, plus three talismanic copper tablets. In the wide lane 4, west of this structure, were found six skeletons in various postures, one being that of a child. Over the legs of one and the torso of another lay the partial skeleton of an unidentified animal, the juxtaposition probably fortuitous. The excavators inferred that the skeletons had been interred here after the house had ceased to be occupied; this was not a regular burial, but one that followed a sudden raid or severe epidemic (Marshall 1931:222 ff.).

Amongst these is also the case of the 'well room tragedy'. In an unusually well constructed and probably not ordinary house (DK-G South, Block 8 A) dating to the very last occupation of Mohenjo-daro (Mackay 1938:92 ff., Pl. XIX), is a well room (Fig. 6). For some reason the steening of the well had not been raised in keeping with the rising levels of the city, and steps led down to it from Low Lane. On the steps lay two skeletons, one of them of a young woman, found where they had died. The skull of the other lies between its legs, as if the man had fallen over backwards and died. In Low Lane also there are two skulls—the

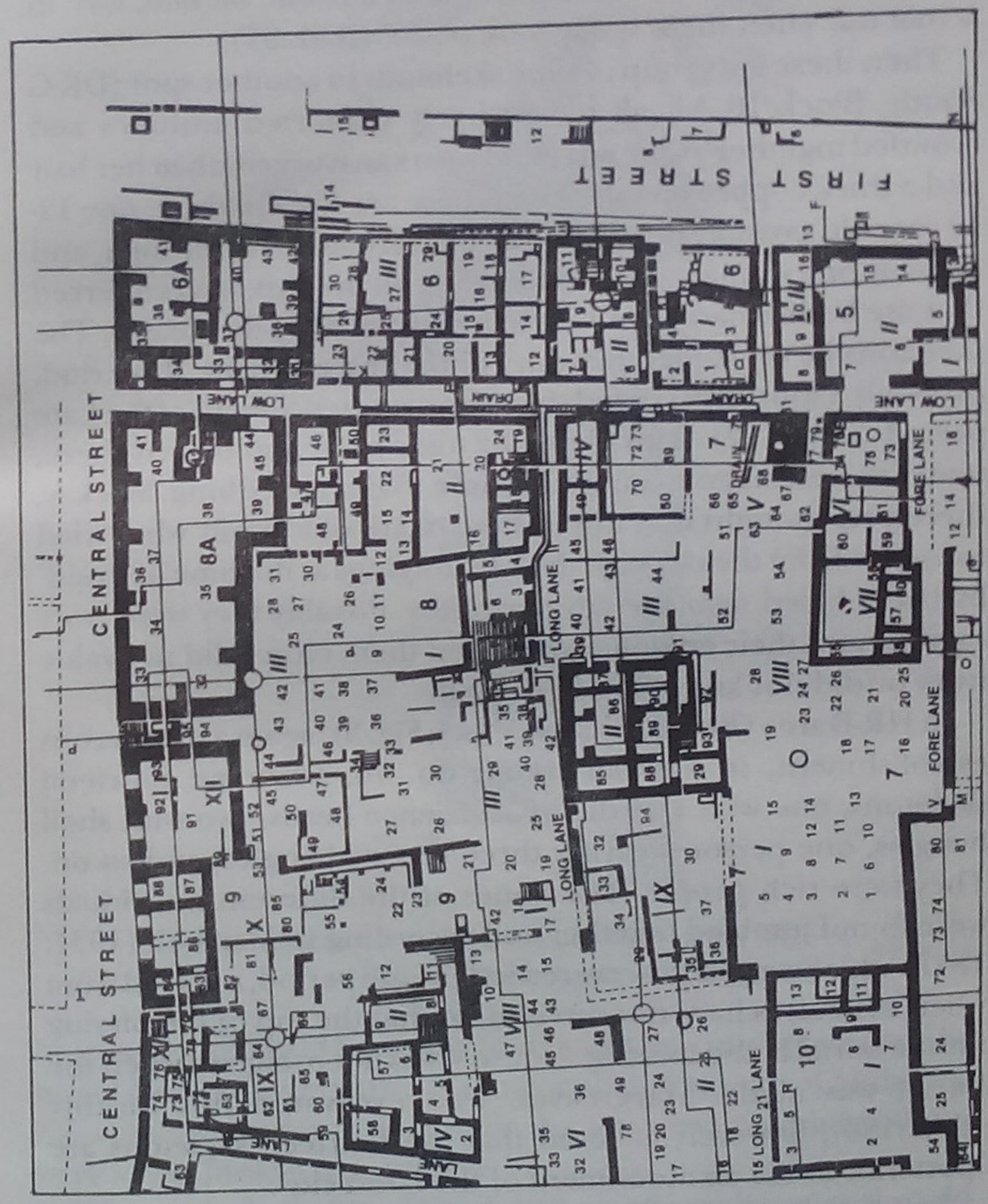


Figure 6. The DK-G south area in Mohenjo-daro with House 8 A and its Well Room.

rest of the remains presumably devoured by animals. Mackay was convinced that the four were murdered and that this event had occurred during the terminal occupation of Mohenjo-daro (rather than after it had been deserted): the well room, he said, was 'in actual use when the tragedy took place' (ibid.:95).

Then there is a group of nine skeletons in another spot (DK-G South, Block 10 A), all in 'strangely contorted attitudes and crowded together'. One girl child wears an ivory comb in her hair and a thick copper bangle. In all there are five children, one 12-14 year old possibly decapitated (ibid.:118, 622), three men, and possibly one woman. The bones being all present, it was inferred that the bodies had been hurriedly buried after the deaths. The skeletons lie on ruined masonry of the Intermediate III period, probably a spot unoccupied since the commencement of the Late period (ibid.:117). Two elephant tusks were also buried there, one of these a magnificent piece more than a metre long. Mackay, therefore, thought that this was the death of a family who 'tried to escape from the city with their belongings at the time of a raid' but were killed near the city periphery. Possibly they were ivory carvers, and their enemies who killed them either did not value ivory or did not know how to carve it.

In HR-B area (Block 2) house V (see Fig. 3), again a prosperous establishment, in a small room, no. 74, occurred fourteen skeletons, one with a girdle of 75 faience beads, two with shell bangles, one person wearing three bronze bangles, and so on. They were rich people. The bones of the different individuals were found jumbled together and according to Marshall (1931: 184 ff.) this mass death occurred in the Late period, a period from when structures have not survived, so that the top of the pit dug for the burial is also missing. House V was not occupied when the burial was made. Hargreaves, who excavated this locality (ibid.:186), however, believed that the fourteen skeletons are 'posterior to the abandonment of the latest city'.

In a deep sounding at the western edge of the HR residential area in the south of the city, Dales came on five skeletons of the latest phase of occupation (Dales and Kenoyer 1986:473 ff.). They lay in a stratum of debris, broken brick and silt, nowhere near a floor or street surface (Fig. 7). Actually, the bones lay on top of sherds of the 'Jhukar' type. This is a late pottery, believed

Figure 7. Dales' section through a street at the edge of HR area, Mohenjo-daro.

by some to be post-Harappan in date. Dales concluded that the burial dated to a time after the major abandonment of Mohenjo-daro, a short terminal spell when the few remaining inhabitants were using Jhukar type pottery.

To recapitulate, these burials are significant because they do not follow the prevalent modes of disposal of the dead; most were intramural burials—in one instance bodies actually lay unburied on stairs—although the latest houses below which they were deposited have not survived in every case. There are no grave goods for the afterlife with these bodies; as stated, the kinds of

ornaments occurring with them are not the sort routinely found in Harappan graves; these people appear to have been buried in whatever they were wearing at the time of death. It is also significant that one person was decapitated and that among these group burials, children occur.

When we dip into the Mesopotamian genre of 'lamentation' poetry that mourns the destruction or desertion of cities, we get a glimpse of what political conflict entailed. Akkade was the capital of the emperors Sargon to Naram Sin from roughly 2370 to 2100 BC. Referring to Akkade, a poet laments: its 'royalty was not to occupy a good, steady seat'. Hill tribes of the Zagros to the east had destroyed the city and the hill men are described with the utmost contempt: 'of human face, dog's cunning, monkey's build', 'nothing escaped their hands'. Of immediate relevance to our context are lines about the last days of this Mesopotamian city: 'He who lay down ill on the roof, died on the roof. He who lay down ill in the house was not buried. The people from their hunger were coming to blows among themselves.... Dogs banded together in the silent streets.' Finally, 'the fox of the ruined mounds swept its tail over the consecrated place of ritual hand washing' (Jacobsen 1987:359 -74).

HARAPPA

The evidence from Harappa presents a similar scenario. Here too the uppermost strata on mounds AB and F have scanty building remains, and those still extant were constructed of brickbats (Vats 1940). Current excavations (Kenoyer 1991; Meadow and Kenoyer 1994) distinguish a Late period (no. 3) within which the lowest stratum (no. 3A) shows unrepaired walls, non-functioning drains, and animal skeletons in the streets. This was, however, followed by a phase of rebuilding and repair. In the uppermost (no. 3C) level, scored goblets are abundantly found; there are encroachments on to the streets, and extensive brick robbing. Period 4 on mounds E and AB is identified by Meadow and Kenoyer as transitional between the Harappan and the Cemetery H culture of period 5 when people using a totally different kind of pottery buried their dead in the old cemetery of Harappa. The architectural remains of levels 4 and 5 are scant and those that

occur are structures utilizing assorted sizes of bricks (Kenoyer 1991:56ff.; Dales and Kenoyer 1991:199ff.).

In Late levels on mound F, Vats (1940:85) found a cache of bronze tools and unfinished bronze artefacts. A very rich hoard of jewellery (no. 8060) has also been found buried under the floor of one of the so-called 'workmen's quarters' (see Ratnagar 1991:44-5), perhaps dug in from a higher stratum. The figure-of-eight shaped silver plate brooch in Pl. 4 has 3 gold strips soldered on it, bent into the appropriate shape. Rows of miniature steatite beads, capped with gold, fill the spaces. There were also a large number of gold beads and a conical cap and carnelian beads in this hoard.

On the edge of mound F was found a mass of ash with partly burned human bones, as well as a quantity of stone mortars and pestles—representing the dismantling process? Vats (1940:50), however, dismisses this as 'nothing more than rubbish'.

Few scholars give importance to a find in area G of Harappa (ibid.:192-202). Here (Fig. 8) the uppermost stratum produced

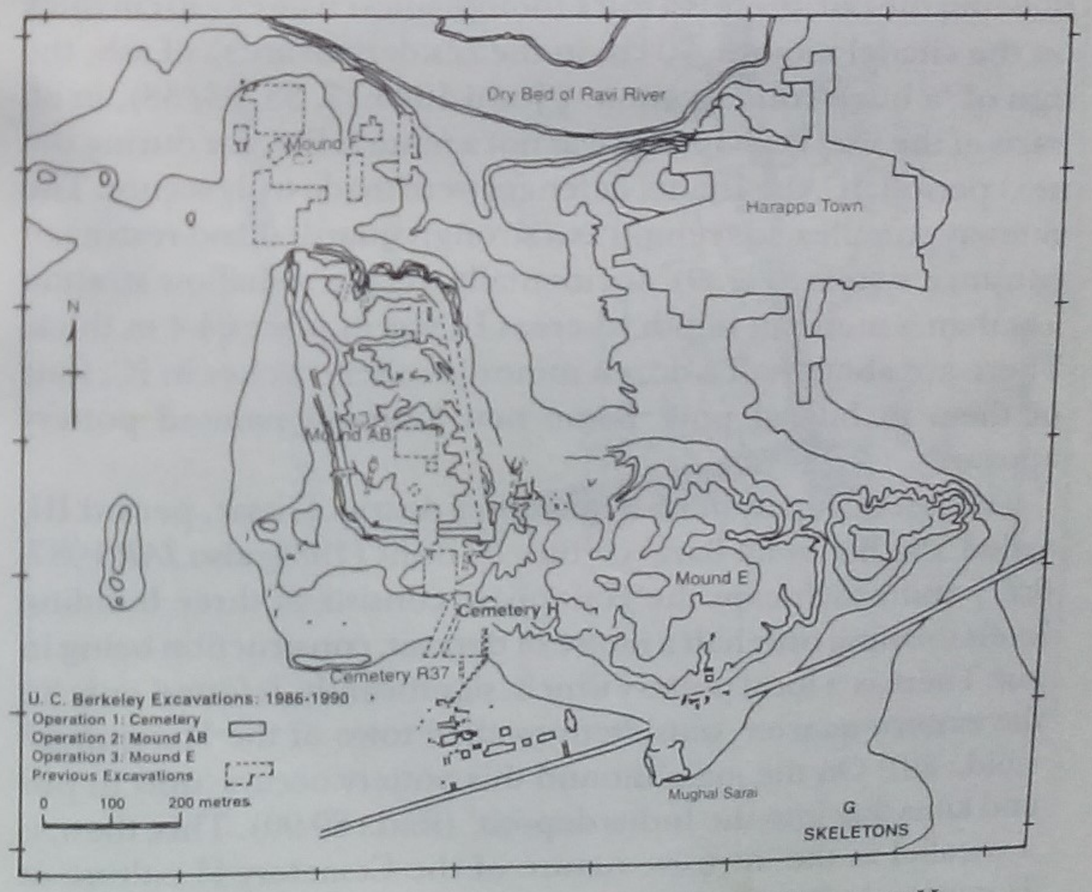


Figure 8. The site of Harappa, with Area G, and Cemetery H.

the usual Harappan material. A pit dug about 1.5 m below the surface contained 20 skulls and 10 mandibles, miscellaneous human bones, 11 scored goblets, other pottery, and a headless skeleton. The skeletal remains represent 6 children, 9 men, and 4 women among others. Vats suggested that this burial followed a massacre, accident, or epidemic. The last appears improbable as the skeletons are incomplete and the skulls disproportionately many. The pottery in the pit (and there are no personal ornaments) indicates that some kind of ritual was followed in the burial. Interestingly, the material found in area G could represent a phase intermediate between the Harappan and Cemetery H periods (Sastri 1965: 60-1).

OTHER SITES

The evidence at Surkotada in eastern Kutch is not as extensive, but is telling in its own way. There appear to have been disastrous events in the late period of occupation. Between IB and IC levels, IC being the last, there is a thick though uneven layer (30 cm thick on the citadel mound, 70 cm in the residential area) of ash, the sign of 'a huge conflagration' (Joshi 1990:17, 33, 35, 38), in all parts of the site. Perhaps this was not a natural fire, for during the next period, IC, the citadel defences were made truly secure. The gateway complex was rebuilt as a strongly guarded and restricted entrance system (Fig. 9). Incidentally, IC was a shallow stratum less than a metre in depth whereas IA was in places 4.4 m thick. There are about half a dozen minor jewellery caches in IC, four of them in buried pots. Some new kinds of painted pottery appear.[5]

The last occupation of Banawali in district Hissar, period III, called 'the Banawali-Bara' culture by Bisht (1984; also *IAR* 1987-8:27) and which caps the Harappan, consists of three building levels totalling only half a metre of deposit, construction being in *pisé*. There is a local pottery which, significantly, is found only 'in the eastern quarter, outside the walled town of the Harappans' (ibid.: 89). On the main mound this pottery occurs 'only in pits and kilns dug into the Indus deposit' (ibid.: 89-90). This, then, is a parallel to the intrusive nature of the Cemetery H culture at Harappa. At Balu in district Jind (*IAR* 1983-4:28-9) there was a

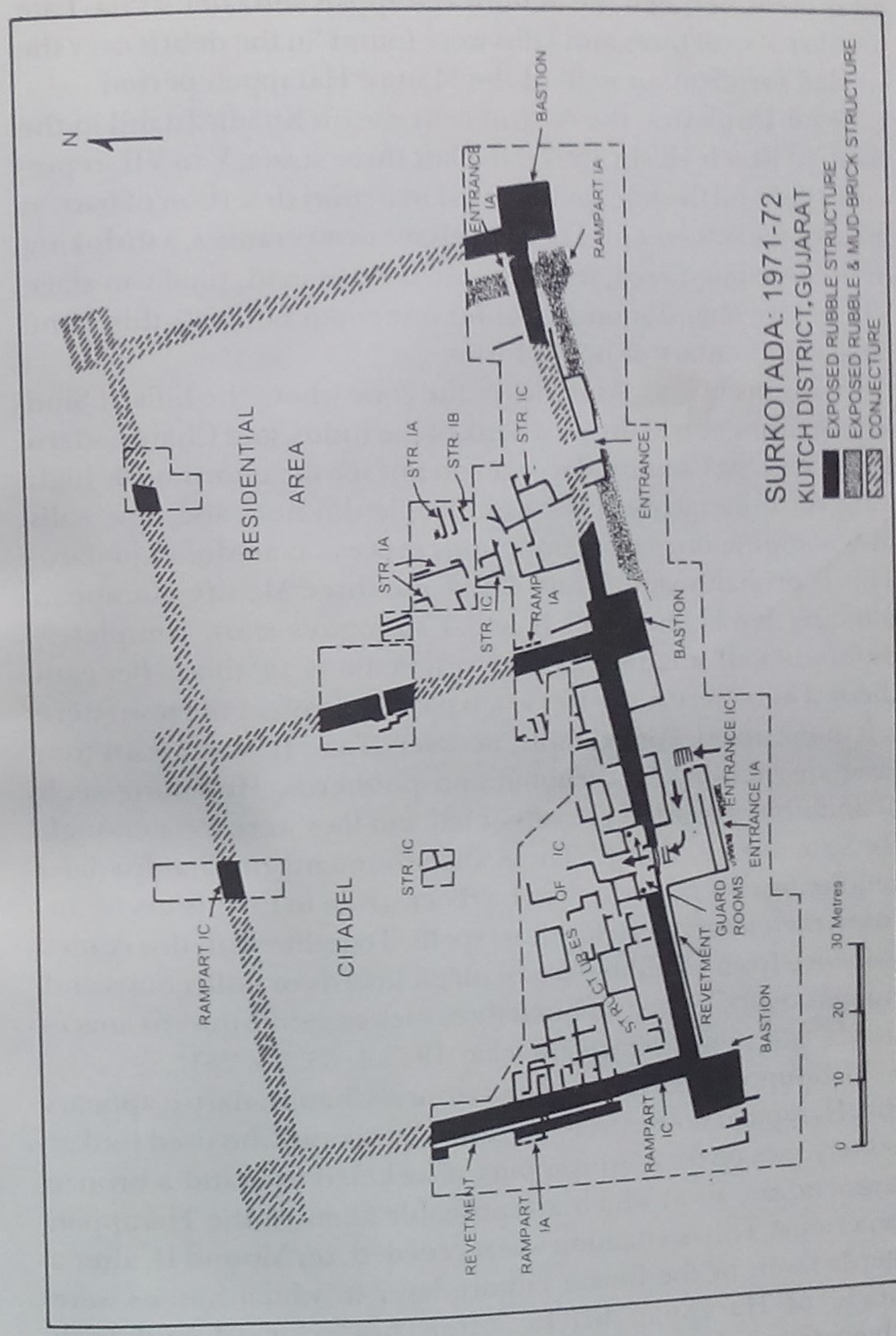


Figure 9. The site of Surkotada with its fortified citadel entrance.

clear break between the Mature Harappan and later strata. Late mudbrick structures and kilns were found 'in the debris over the eroded fortification wall' of the Mature Harappan period.

As for Dholavira, the magnificent site on Khadir Island in the Rann of Kutch (Bisht 1997), the last three strata, V to VII, represent a general decline, punctuated by a short desertion of part, at least, of the settlement. These levels see new ceramics, a shrinking of the inhabited area, jerry-built structures, and, finally in stage VII, before abandonment, round one-room houses—this is the most rudimentary of house forms.

In southern Sind, Amri lies in the zone where the hills of Sind Kohistan abut on to the west bank of the Indus, and Chanhu-daro 15 km east. At Chanhu-daro you do not see the enormously high walls of Mohenjo-daro because people did not raise new walls over standing ones in a continuous process as at Mohenjo-daro. This is probably significant. There are three Mature Harappan building levels and level II and I structures show completely different wall alignments and orientations to those beneath them. There were junctures when parts, at least, of the town were left unoccupied. For example, between II and III there is a 4-foot layer of rubbish, dust, rubble and potsherds. How long such abandonments lasted we cannot tell, but they were long enough for structures to decay.[6] These abandonments of Chanhu-daro require further thought than has been given to the history of the town, even if they were for short spells. Together with this comes evidence from Chanhu-daro of metal hoards or collections and numerous unfinished manufactures such as saddle querns, mace-heads, and shell artefacts (Mackay 1943:4, 63, 33, 28).

In the uppermost Harappan stratum at Chanhu-daro it appears that Harappan houses were occupied by people who used Jhukar pottery, ornamental bronze pins, a socketed axe, and a bronze cosmetic jar, all of which are probably alien to the Harappan repertoire. This occupation was succeeded, on Mound II, after a sterile layer, by the Jhukar culture layer in which houses were made of Harappan bricks, often one-roomed and with characteristic brick-on-edge fire-places, and large numbers of bone awls for mat making. The Jhukar occupation is limited in extent: on Mound I, for example, Mackay found very few Jhukar

sherds and says (ibid.:59) these could have been left there by casual visitors.

Mughal and Dales were convinced that the Jhukar is only a late developed ceramic tradition and not the sign of a new culture in Sind, leave alone the remains of intrusive Aryans (Dales and Kenoyer 1986:57; Mughal 1990, 1992). Mughal argued that at the site of Jhukar, 27 km north-west of Mohenjo-daro, Mature Harappan pottery was present in all three phases and was associated with Jhukar pottery, which means that it was only an evolving ceramic tradition. Possehl, too, (1979:243-5) stressed the absence of stratigraphic breaks between the Harappan and Jhukar pottery strata at the sites in Sind.

Yet the evidence at Chanhu-daro of other artefacts like bone awls, fire-places, head rests and seals, and a totally different style of habitation have perhaps not been sufficiently appreciated. The fact that Mackay found it difficult to isolate Jhukar material from Harappan was because standing Harappan structures were occupied, disturbed, and modified—not because one culture grew, little by little, out of the other.

In 1979 Casal elaborated on the sequence at his site, Amri (Casal 1964), with an interesting perspective on the history of the two neighbouring settlements of southern Sind. At Amri there were five strata with Harappan material, with a few changes in pottery from one to the next. In the uppermost (level III C) of these strata, occurred the pointed-base scored goblet together with Jhukar sherds, brought by intruders, Casal said (1979:108). But this stratum, III C, was the only Mature Harappan level with baked brick construction in the Harappan mode, with cubical weights, writing, and an uninscribed seal (ibid.:109). It has ceramic parallels with Late Mohenjo-daro. Casal therefore believed that Amri was a poor and insignificant settlement to which people of the richer Chanhu-daro had fled (Amri period III C); that there had been quick abandonment of Chanhu-daro due to raids, but that hill raiders squatted at Chanhu-daro before moving on to Amri where they mixed with the local people and then went on to Mohenjo-daro and Jhukar (ibid.:110). Casal associated Jhukar pottery with raiders from Baluchistan because, according to him, this ceramic also occurs at sites like Periano Ghundai

(Mackay 1943:130); but there is also a similarity between Jhukar pottery and that of pre-Harappan Amri even though Casal saw it as a mixture of Indus and Baluchi elements. (It needs to be pointed out that there is no Jhukar building/occupation stratum as such at Amri IIID; the only manifestation is a large quantity of Jhukar pottery and the odd seal, all in much disturbed contexts (Casal 1964:48-50).)

This is an attractive hypothesis although it remains for us to confirm the relative chronology of the two settlements, and although Amri would be a more logical first halt than Chanhu-daro for raiders from the Kohistan. At Amri, too, we have seen that the 'hill raiders' apparently did not construct many durable structures—in fact much Jhukar Period construction must have been damaged when the Islamic fort was constructed on the mound—but the quantity of Jhukar pottery in level III D sustains the argument against a picnic or week-end camp of casual visitors.

RAIDS, SKIRMISHES, STRIFE, INVASION?

Hill raiders or even rural people descending in bad times to pillage a town, however, are just that. They do not leave trails of massive destruction such as those that the Sea Peoples visited, in a series of attacks between around 1220 and 1150 BC, on western Asia, heralding the literal end of the Bronze Age for an entire region.[7]

The Sea Peoples, as they were known to the Egyptians, provide an instructive parallel to us. They appeared in western Asia and the eastern Mediterranean and moved relentlessly on to Mycenae with its massive stone fortifications; then on to the great Hittite capital with its hill citadel, Hattusha; on to Tarsus; on to copper-rich Cyprus (destroying Enkomi after a sea battle); on to the flourishing trading state of Ugarit with its four harbours and 1 ha palace (totally destroying the latter, smashing much fine craft work, and pillaging some valuables); on to several small centres in Palestine; and on, by sea, to Egypt, where they were crushed. Of diverse ethnic identities, and an amalgam of sea pirates, erstwhile nomads, and ex-mercenaries, they left these massive Bronze Age centres destroyed and often depopulated. They captured livestock

and carried captives with them. Egypt was battered and Palestine divided up into several Philistine chiefdoms, vassals of Egypt. On the whole, after 1200 BC, large states were split into smaller entities and some regions saw a regression to the small hamlet and the household economy based on subsistence agriculture (Sandars 1978:57). Mycenae, Hattusha, Ugarit and Alalah never rose again. As for the Hittite empire, not only was Hattusha destroyed and abandoned, the entire cultural system perished. 1200 BC saw the end of the Hittite language and literature (and also of Ugaritic literature and its script). Likewise, it saw the end of the Mycenaean civilization. Long centuries of a 'Dark Age' followed in many parts of the Mediterranean (Sandars 1978). The 'large-scale downfall of a complete culture' is how this phenomenon has been described (Crossland and Birchall 1973:214).

The evidence of raids/skirmishes at Mohenjo-daro or at Harappa is actually not comparable to this, and the hill raids/incursions/squatters may be viewed as a symptom of Harappan decline rather than its cause. In fact, even the Sea Peoples' devastations are regarded by Sandars (1978) and Liverani (1987) as only a precipitating factor that hastened the end of the 'over-specialized' and overcentralized Mycenaean economy, the Hittite empire plagued by border rebellions and rebellious vassals, an Egypt under economic and political strain, and a Syrian economy that was so concentrated in the palace that the physical collapse of the latter meant the end of the organization of the kingdom, brigandage in the countryside, and other signs of chaos.

We expect long-standing Great Traditions to endure military crises, as did Egypt and various Mesopotamian states at several junctures. For example, the Hyksos ('hill chiefs') who occupied lower Egypt in the Second Intermediate Period (1786-1550 BC) after the end of the Middle Kingdom, had come from Palestine with horse- and chariot-warfare, and are frequently cursed in the execration texts and portrayed as irreligious in later literature. But they emulated the Egyptian aristocracy, learned the Egyptian mode of writing, and adopted the cult of Re the Sun God. Their incursions did not bring about the end of the Egyptian civilization, even if they brought a particular dynasty and state to its end. So,

too, the Gutians of the Zagros, who attacked the empire of Akkad in swift pillaging raids, are described as inhuman and nasty people but they adapted to the Mesopotamian culture and very little in the material culture, art, or literature after 2230 BC can be discerned as 'Gutian'.

We could also cite the instance of the fall of the splendid city and dynasty of Ur, around 2000 BC, in southern Mesopotamia. Its last king was betrayed by his officials; there were incursions of the pastoralist Amorites from the western desert; acute shortages of grain and difficulty in moving it from one city to another plagued the rulers of this Third Dynasty of Ur; ultimately the king of Elam (south-western Iran) besieged Ur and carried its aged ruler away as a captive. Soon after, several Amorite chiefs set up rule in different Mesopotamian cities. This disaster was remembered in a poetic lamentation for Ur. A few lines, translated by Jacobsen (1987:447-74), run as follows:

> Bitter is the wail, city,
> the wail set up for you!
> Bitter is the wail, city,
> the wail set up for you!
> Brickwork of Ur, bitter is the wail,
> the wail set up for you!....
> City, though yet your wall rings you around,
> your people are perished from you!
> Bitter is the wail for you!

The ravaged city is compared to a 'pulled-up harvest shed', a structure demolished once the grain has been carried home. As for the devastation itself,

> the country's blood filled the holes like copper or tin [poured in moulds]....
> On the country's goods, piled and piled as they were, dirty hands were laid.
> In the country's storehouses, abounding and abounding as they were, fires were lit.

This did not, however, signal the end of the civilization of Mesopotamia. The system of writing and the literary tradition continued uninterrupted for many centuries, with certain third-millennium cults flourishing as late as the third century BC.

NOTES

1. I exclude from this rubric sites of the Kulli, Bara, Siswal, and Rangpur II B-C cultures, as also Rojdi, Prabhas and other contemporary sites.
2. Consider the abandonment, by the maize-cultivating Anasazi people, of south-western Colorado, a homeland they had occupied for almost a millennium until about AD 1000. They had peopled this area more densely than it was to be even in the nineteenth century. In the fortuitous circumstance of being able to date, through tree rings, the wooden posts of the residential houses of several sites, archaeologists realized that prevailing theories about a major drought having precipitated abandonment were wrong. Instead, they found that there had been four droughts in succession, separated by periods of adequate rainfall. Moreover, there had been not one but a series of abandonments and re-occupations of villages, over the span of a century. House abandonments did not occur only in periods of drought, so that it is now believed that individual houses were emptied only as and when they became old (Schlanger and Wilshusen 1993).
3. Their sequence went, from top to bottom, levels Late I (a and b), II (a and b) and III, Intermediate I, II, and III, and Early I.
4. We are reminded of the account of Demosthenes, *c.* 330 BC, of a bad drought in Attica when very small portions of barley were measured out and distributed to the people.
5. Bhan (1989) suggest that Nagwada, a 1.6 ha site in the 'neck' of the Saurashtra peninsula south-west of Ahmedabad, is contemporary with Surkotada IC (and Lothal A IV). At Nagwada there was house construction in either mud brick or stone rubble, and a stone bead industry. Among the varieties of pottery there was a Black-and-Red ware. As at Surkotada, this ware may signify the advent of a new ceramic tradition. But we know nothing of the circumstances of abandonment of this small settlement.
6. In Iran it has been observed (Weiss and Young 1975:2) that a village abandoned in 1959 became an unrecognizable ruin by 1973, fourteen years later.
7. Following an interregnum after the invasions, over various parts of western Asia, the use of iron began to spread. After the fall of the Hittite power iron production ceased to be a Hittite monopoly, for the iron producing land of the Kashka people (of Anatolia) was now freed from Hittite subjugation. Sandars (1978:195) suggests that the Kashka were instrumental in the Hittite collapse. Iron from Anatolia and other regions now became available and could be used for heavy-duty tools like adzes, axes, sledge-hammers and saws, and thus the fine woods of the eastern Mediterranean could be exploited on an adequate scale for ship building. All this made possible the efflorescence of Berytus, Tyre, Sidon and Byblos as maritime centres, which allowed the influence of the Phoenicians to spread.

4

Migrations

While discussing town and village desertions, we had ruled out population extinctions. In this context, the important factor is that desertions of settlements can be due to the migration rather than the death of the inhabitants concerned. Let us now think about group migrations at the end of the Harappan period.

Harappan sites that have survived best are those along the Hakra system (Fig. 10) in Pakistan, identified by some as the lowest reaches of the Vedic Sarasvati. Because the Ghaggar-Drsadvati system became practically defunct some time in the second millennium BC, the deserted mounds along its lowest stretch were not subjected to repeated river floods or erosion. The field surveys by Mughal located 174 Harappan villages, towns, camps, and brick- or pottery-firing sites, among them 83 habitation sites (villages as well as towns). In the succeeding Cemetery H period there were 50 sites north and north-east of the medieval Derawar Fort, 28 of them habitation sites[1] with or without kilns or manufactures. While in the Harappan period 9 or 10 sites (6 per cent) were camps, presumably of animal herders, in the subsequent period 13 sites (26 per cent of the total) represent camps. The largest site of the Harappan period (Ganweriwala Ther) in this tract was about 41 hectares; in the next period the largest site in this subregion, Kudwala, was 38 hectares. From Mughal's raw data (1980) it can be calculated that the total settled area in this tract fell from well over 450 ha[2] in the Harappan period to 233 ha[3] which was less than half the previous settled area. Thus while Mughal (1990 b) sees continuity, for example in the four-tier settlement hierarchy of the region, I would place more emphasis on discontinuity. Also, 38 ha for the largest Cemetery H site may not be much less than the 41-ha size

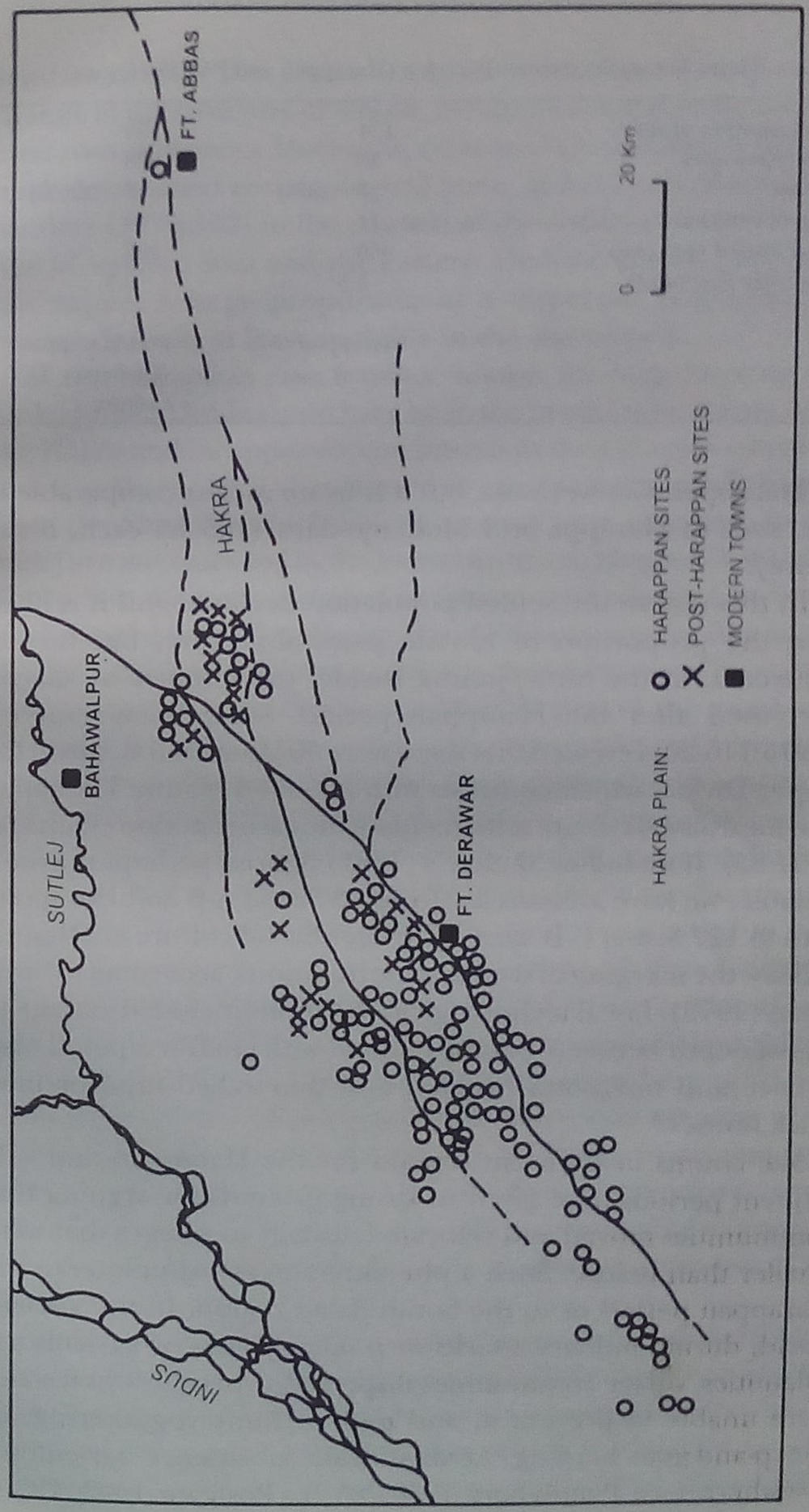


Figure 10. Hakra Plain: Harappan and Post-Harappan sites.

HAKRA VALLEY SETTLEMENT PATTERNS (Harappan and Post Harappan)

Total number of sites	174		50	
Habitation sites	83		28	
Camps	9	(6%)	13	(26%)
Largest site (ha)	41	+	38	
Total settled area (ha)	450		233	
Mean size (hectares)	5.5		8.3	
	Harappan Period		Post-Harappan (Cemetery 'H') Culture	

of Harappan Ganweriwala, but it is by no means comparable to the sizes of Harappa and Mohenjo-daro (125 ha each, if not more).

In this region the settled population declined and it is likely that the proportion of mobile pastoralists rose, but further upstream, in the Sutlej-Jumna Divide, the number of villages increased after the Harappan period. Suraj Bhan's surveys (1975:116-26) revealed that there were 86 Mitathal II B sites in the upper Divide, which contrasts with about 58 Mature Harappan and local Siswal culture settlements of the earlier period (Ratnagar 1991:83). If we follow Shaffer's (1981) figures, perhaps the most reliable, we have an increase from 43 Siswal A-B and Harappan sites to 127 Siswal C-D sites. The later Siswal culture at Mitathal II B saw the merging of two ceramic traditions, according to Suraj Bhan (1975). Local technological traditions included storage in pits of depth between 1 and 2 m lined with chaff-tempered clay; faience and terracotta bangles; and thin-walled mud or mud brick houses.[4]

Site counts in different regions for the Harappan and subsequent periods have given us strong grounds for arguing that communities moved and relocated, usually to villages that were smaller than before. Such a phenomenon is not unique to the Harappan period or to the South Asian region. In the ancient world, during military attacks or political crises or agricultural calamities, village communities dispersed, especially when states were unable to prevent it, and took to hunting-gathering, or sheep-and-goat herding, or small-scale subsistence agriculture elsewhere (see Pendlebury 1939:285 ff.; Postgate 1992: 293-4;

Sandars 1978:57 ff.). There would have been an accompanying change in the structure of labour, as families were thrown back on their own resources. Moreover, relocated groups, being initially small, leave scant archaeological trace, as has been observed by Sandars (1978:183) in the context of the collapse of the Bronze Age of western Asia and the eastern Mediterranean. Hence we can expect a large proportion of a dispersed population to remain, initially at least, invisible in the site record.

In the Harappan case a major reason for migration up the Sutlej-Jumna Divide could have been the progressive drying up of the Hakra and its upper section known as the Ghaggar system in India; as Misra (1984) has argued so convincingly, small streams from the Shivaliks which fed this system were captured by the Sutlej in some cases and by the Jumna in others. Mughal (1984:501) claims that the tract occupied by Cemetery H sites in Cholistan, stretching between Fort Derawar and Yazman, was fed by a south-flowing offshoot of the Sutlej, joining the Hakra near Yazman. It is important to note that in the Mughal period the combined Jhelum, Chenab and Ravi rivers joined the Indus at Uchh while the combined Beas and Sutlej fed the Indus further downstream (Irfan Habib 1982: 11). The Hakra, too, dried up subsequently; in the next (Painted Grey Ware using) period sites were located within its bed. If, indeed, the Hakra-Ghaggar is the Sarasvati of the *Rgveda*—and this is by no means proved—we need to note that it is described in that text (dated between 1500 and 1000 BC) as a major river; this would mean that the river was not totally and finally dry towards the end of the Harappan period. I would also like to emphasize that hydrological factors may have prompted migrations, but this does not mean that they were a 'cause' of the collapse. We distinguish 'cause' from 'enabling factor' and from 'trigger' or 'precipitating factor', and these in turn from 'symptom'. Large-scale migrations, it would be reasonable to assert in the current state of knowledge, were probably a symptom of the collapse of social institutions.

Again, comparative data provide a corrective to hasty conclusions. In southern Mesopotamia as a whole there was, around 2000-1800 BC, (1) an agricultural crisis of some magnitude involving a rise in some tracts of soil salinity which led to falls in yield (Jacobsen and Adams 1958; Adams 1981:150);[5] (2) political

fragmentation; (3) immigrations of Amorite tribes from the western desert; as well as (4) a westward shift of the Euphrates which must have left much hitherto fertile land uncultivable (Postgate 1992:45). These factors could have been responsible for an overall, pan Sumer, decline in total settled area from about 2,725 ha before 2000 BC to about 1791 ha by 1650 BC (Adams 1981:138-43). However, it is well known that the shrinkage or abandonment of urban centres in the south, and the paucity of written material in the period following about 1750 BC, does not amount to the collapse of the Mesopotamian civilization, whose traditions were so strong that a king of Babylon (Nabonidus) in 555 BC searched for the inscriptions of Sargon of Akkade who had ruled in 2370 BC; and the cult of Ishtar flourished at Uruk into the third century BC!

The fact that Harappan settlements were deserted not only in the Hakra stretch but in Makran, Kutch, Sind and southern Punjab also, prompts us to conclude that hydrological factors were not the only cause even of abandonment/migration, and that other factors may also have been at work. Let me repeat, at the cost of sounding monotonous, that settlement abandonment is not tantamount to civilizational collapse.

NOTES

1. Possehl (1997:460) provides the contrast in terms of the total numbers of sites, 174 Harappan versus 41 Cemetery H. This would mean a more than four-fold contrast in settled area between the two periods. However, it could be misleading to include numbers and areas of industrial and camp sites in the calculation.
2. The total of 73 measured sites was 390 ha, the mean being 5.5 ha; we add about 55 ha for the unmeasured 10 sites to get a total of 450 or so.
3. 26 measured sites give a total of 216 ha with the mean at 8.3; add 8.3 x 2 to get a grand total of 233 ha.
4. Even further upstream, near the Sutlej river, at Kotla Nihang Khan, Ropar, and Bara, flourished the 'Bara culture'. The transition or transformation here, towards the end of the Harappan period, has unfortunately not been worked out in the available literature.
5. Powell (1985), it needs to be said, has argued at length against the salinization theory.

C. P. R. I.

5

The Problem of Legacy and Survivals

Like the Minoan and Mycenaean civilizations and that of southern Turkmenia, and in contrast to the Great Traditions of Mesopotamia and Egypt, the Harappan tradition did indeed come to an end. If we examine the nature of the succeeding cultures, we find a contrast that is too great to allow us to make a case for lineages of tradition and continuity. In this I follow more the thinking of F.R. Allchin (1993) and B.B. Lal (1982, 1997), than of G.L. Possehl or M.R. Mughal (who, it may be recalled, believe that the Harappan tradition survived into later centuries)—without, however, pursuing Allchin's intriguing idea about the fusion of Harappan and Aryan elites and their cultures constituting what was to become the civilization of India of the first millennium BC.

Jarrige (1973) and Mughal (1990b) interpret the end of the Harappa civilization as a splintering into regional cultures; Jarrige even suggests a revival of some pre-Harappan ceramic traditions. We cannot go into all the evidence (often patchy) on the succeeding cultures here though we have already glanced fleetingly at the Jhukar, Cemetery H, and the local Siswal tradition of the Divide. The major portions of the evidence are given in outline in the Appendix. Suffice it for the moment to consider the map of their locations (Map 1). Relevant are the regions between what was to be Gandhara in north Pakistan, and Kathiawad. These cultures have their own characteristic artefacts and their own chronological distributions (Mughal 1990b).

As the entire Harappan population was not wiped out, not every one of its cultural elements was necessarily obliterated. My point, however, is that what we call the Harappan civilization did

not endure in a form recognizable as Harappan, or as a Great Tradition, to the archaeologist. By civilization we do not mean this or that pottery or the aesthetic quality of artisanal production, but a nexus of interrelated elements that co-occur in site assemblages and represent the political and economic structure of a state with urban centres, and with social stratification, however inchoate. Problems arise, however, because of the persistence of certain Orientalist ideas about the unbroken cultural continuities of our history. Such views insist that ours is a great land of tradition (as opposed to a past replete with change, volatility and dynamism): analyses of Indian culture must deal with religion more than technological discoveries![1]

An interesting instance of the persistence of ideas about unchanging India is B. Allchin's study of the carnelian bead industry over the ages (1979). Allchin describes its origins as a specialized, urban, Harappan craft. She shows that carnelian bead manufacture is thereafter evidenced only around 200 BC (that is, a thousand and five hundred years later), at Ujjain. The authority cited on bead production at Ujjain (Banerjee 1959) specifies, among the aspects of manufacture, the placing of bead blanks in jars stopped tight with agate pebbles; and the slow heating of these jars on channelled furnaces, the channels lined with clay and filled with charcoal and dung fuel. These features do not occur in Harappan bead production workshops, to my knowledge. The beads from Ujjain are small, and the long carnelian bead was not produced after the Harappan period, nor yet micro-beads of steatite. Yet for Allchin the Harappan tradition persisted not only into the iron age at Ujjain, but also into the twentieth century.[2]

Chakrabarti and Lahiri (1996:199 ff.) have found that 'the basic techniques of the Indus coppersmiths have continued to this day', especially those of vessel making. We could ask, however, whether there exists a wide choice of techniques for cold hammering and raising of copper and bronze. The precise similarities are not enumerated and in any such situation we can always ask whether it is truly a line of tradition, or technological parameters, that account for similarities between prehistoric and present times.

Consider next a material like ivory, the carver's delight because of its density and its hardness suited to take detail, but not too difficult to cut (being less than 3 on Mohs' scale). Its organic content enables it to retain a certain elasticity and to acquire an exquisite sheen when polished. Mackay (1938:579) remarked that at Mohenjo-daro ivory was much more commonly used than bone, even for humdrum things like *kajal* sticks, gamesmen, pins and awls, as well as carved plaques and 'divination sticks'. Yet ivory appears to have been as insignificant in the post-Harappan cultures after 1800 BC as it had been in pre-Harappan Mehrgarh. At Lothal (Rao 1985:626 ff.), 40 artefacts of ivory and a piece of ivory tusk are catalogued. Among these only 2 items come from Period B or level V, which is post-Mature Harappan. At Chanhu-daro (Mackay 1943) all the carved ivory—tenons, pins, combs, pegs, etc.,—as well as a large tusk, come from Harappan and not Jhukar levels. True, in the lowest levels at post-Harappan Pirak in the Kacchi a piece of elephant tusk had been found, but it was only later, after about 1100 BC, that ivory artefacts were found there (Jarrige and Santoni 1979).

A contrast to ivory is provided by the case of faience. Exquisite products of that craft displayed in the Ropar Museum, for example, come from the post-Harappan Bara culture. Faience appears to have been a craft that survived—indeed, flourished—in the immediate aftermath of the Bronze Age. This intriguing factor demands investigation. Jaya Menon (1991:140-51), in her exploration of the diverse methods employed in the craft, does not give bronze tools pride of place. Copper oxide could be used as a colourant, and perhaps some sharp-pointed tools were necessary for decoration of beads or bangles. Thus it may be—and this is a tentative suggestion—that the post-urban chalcolithic cultures, though lacking substantial bronze industries or metal tool kits for craft production, could continue to produce faience ornaments.

Contrasts are also provided by objects of everyday use like the ubiquitous 'terracotta cakes' of Harappan sites (Pl. 8). These are normally flat and triangular, but round nodules were also made. They were used to pave bathroom floors and keep the feet free of mud; to pave courtyards, and also to pack fireplaces to hold in the

heat. At Pirak in the Kacchi, from 1700 BC onwards, household fireplaces, however, were packed not with terracotta cakes but with (by now cracked) stone pebbles. At near by Nausharo, terracotta cakes are evident only in Harappan levels, not those either below or above.

The seals are also revealing. Many scholars have remarked on the use of seals in post Harappan times. In Figure 11 we see some Harappan seals, instances par excellence of verbal and non-verbal communication, and their counterparts from the Jhukar culture that followed at Chanhu-daro. Both sorts may have been used for stamping, but they are worlds apart. The seals of the later period carry incised lines or dots; there is no modelling or depth, no figurative depiction, no writing. Clearly a qualitative change had occurred in the level of communication. So also, at Lothal phase V the seals, Rao (1985: 306) says, had shallow engraving and it is 'doubtful if [they] were used at all for sealing packages'.

Figure 11. Harappan and Jhukar seals.

We will not dwell at length on the scarcity of bronze tools or precious metal ornaments or glazed steatite work in the later cultures. Let a few odd instances suffice. At post-urban Lothal, period B, there is (Rao 1985:36) no Rohri chert: local jasper was used in the last period for stone tools. The following tabulation of bead counts at Lothal (abbreviated from Table XXI, Rao 1985:587) is also revealing.

Of a total of 24 faience items other than beads catalogued in the Lothal report (ibid.:610 ff.; 632 ff.), including miniature containers, buttons, bangles, and ear ornaments, only 4 come from phase V. For copper/bronze artefacts the figure is 5 items of the B period out of a total of 111 bronzes excavated (Rao 1985:536 ff.). At Rangpur (Rao 1962-3:143) in level II A (Mature Harappan) there were 4,916 steatite and 73 faience beads; the figures fall to 8 and 8 respectively in the following, Rangpur II B-C period that represents the post-urban chalcolithic culture.

Bead Counts at Lothal

	Period A (levels I-IV)	Period B (level V)
Gold beads	21	3
Copper/bronze	93	4
Steatite	50,000 +	419
Faience	711	107
Agate/carnelian	1,238	42
Lapis lazuli	3	0

Let us now consider domestic architecture. A house is the physical space in which a family lives and works as a family; houses separate families from one another even as they join them when constituent families of a group build similar houses. In different cultures gender differences or familial divisions of labour can be reflected in house form, as also customs of cooking and eating (together or singly, in seclusion or in view of others). As Tuan (1977:112) put it, 'the building is the primary text for handing down a tradition, for presenting a view of reality'. Tuan goes further to suggest that architecture communicates ideas more effectively than does ritual. Moreover, even minor matters such as room size are heavily culture-specific as argued by Fletcher (1995:31). Surely, therefore, the transformation of the dwelling from a thick-walled,

multi-roomed structure with open courtyards of the Mohenjo-daro or Chanhu-daro type to the one-room mud or mud brick hut of the last occupation of Dholavira or Lothal (Rao 1979:34) is enormously significant.[3]

It is also pertinent that street drainage did not survive Harappan culture. Early Historic (post 600 BC) sewage and sullage was treated altogether differently, being sent vertically down into the soil through deep and accurately made and fitting (water-tight) superimposed terracotta rings (Pls. 9, 10).[4]

In Kathiawad, we have seen, in spite of the absence of dramatic abandonments, raids, and secreted hoards, there is evidence of the end of Harappan craft traditions. At Lothal, during the last Mature Harappan occupation (IV), there were encroachments of houses into streets, no street drains, 'rickety houses on the Acropolis' (Rao 1979:32 ff.), the warehouse was in disuse, and so on. New cultural forms and practices marked the post-urban occupation of Period V. No sealings (pieces of clay impressed with seals) were found in level V (there were 91 of these in the lower levels) (Rao 1985:325 ff.). Perhaps also important is the fact that level V deposits cover only the eastern part of the site (ibid.:27). Scored goblets in large number were also missing at Lothal (Rao 1985:339).

There were cultural changes in other directions, too, in Kathiawad. The Harappan period is marked by very few settlements. Thereafter, the towns of Rangpur and Lothal shrank in size, though there was an increase in the number of villages. In an analysis of changing settlement patterns through the ages in Kathiawad, Supriya Varma (1997) found that Rangpur II B-C sites (1900-1500 BC in Rao's chronology) were no less than 140 in number, as against less than 20 Mature Harappan sites. A third of the sites of the later period were less than a hectare in extent, but the average size was over 4 ha (Varma 1997:160 ff.). These sites were spread over the entire peninsula. In the next, Rangpur III period, there were, however, only 44 sites of average size, that is, about 3 ha. It is only in the later iron age that almost 200 sites can be counted for that region, which are on average about 7 ha in extent.

In post-Harappan Kathiawad there appears to have been a change in the crops being cultivated. From the rabi cereals of

Harappan agriculture, the emphasis shifted to the coarse and hardy bajra and jowar, which are adaptable to long dry periods and poor soils.[5] While Possehl (1979:251-3) listed population increase, immigration (neither of these serious contenders) and crop choice as some of the possible reasons for the growth in the number of villages, he also referred to the sedentarization of hunters-and-gatherers in the post-Harappan period. Varma, however, places less emphasis on crops than on the agropastoral subsistence base as the major factor behind the swings in the number of villages. When, for diverse reasons, people invested more time and labour in their fields than in breeding animals, village life would prosper, but the reverse could also happen if environmental or cultural factors prompted people to invest in large flocks of animals. They would then be obliged to move with their animals in search of grazing areas and give less attention to their fields. In the perspective of K.K. Bhan (1989), 'a tendency towards the development of sattelite settlements' in the terminal Harappan period (p. 225) was succeeded by a proliferation of small and low mounds representing the activities of mobile pastoralists, in the rich pasture tracts of north Gujarat. Here Ratnapura, and Kanewal further south in the Bhalbaru tract, have a kind of 'mesolithic' character. Near Bhavnagar too sites like Nesadi may have been only seasonally occupied (Mehta 1984).

The Rangpur II-III culture of Kathiawad has been characterized mainly on the basis of ceramic traits. The perforated jar and beaker went out of use; fabric became less fine and homogeneous; pots were carelesssly slipped; the frequency of coarse red and grey vessels rose although black-painted red pottery continued to be important (Rao 1985:339 ff., 418 ff.). The other aspects of post-Harappan material culture include one-room huts built of mud and posts, blade tools, flakes and microliths, and a few bronze tools (Rao 1962-3:23 ff.). At Rangpur, as at Lothal, Late Harappan houses occupied a smaller area than did the Mature Harappan (ibid.:86).[6]

NOTES

1. We also create problems for ourselves when we fail to define civilization at the outset. Many teachers and students are disturbed by the idea that they cannot claim in their homelands in the southern peninsula or in the mountains

of the north-east, a Harappan past. To repeat, this civilization is an archaeologically defined entity and not the mystic 'source'of all that we believe in today or the seed-bed of what we today conceive of as our Indian identity. I cannot, of course, presume to speak for Pakistani conceptions.

2. While it is certainly important to study current cultural practices in order to understand what kinds of residues particular sorts of activity leave behind—and this is the very kernel of ethnoarchaeological practice—the exercise becomes skewed when the perceived identity between present and past becomes the focus of observation and analysis.
3. If we go by Burnes'account (1973/1834), even in the nineteenth century wood, plastered wickerwork and reed housing was more common in Sind than baked brick construction.
4. See also Pande 1987 on the mistaken notion of continuity from the first urbanization into the second.
5. Fujiwara et al. (1992) mention ragi at Harappa, Cemetery H levels.
6. Mention must also be made of the Prabhas culture, first noticed at Prabhas on the mouth of the Hiran near Veraval, and at sites near Jamnagar and Porbunder (but not the Bhavnagar area). Dhavalikar (1984:247-50) considers this culture to bear 'the indelible stamp of the Harappan'and to be 'a direct descendant of the Harappan culture', but he does not spell out the details except to mention the occurrence of a cubical chert weight, agate beads, and a faience seal carved on both faces, at the site at Prabhas Patan.

It also needs to be said that in Kutch the change in the settlement pattern does not seem to parallel that of Kathiawad. Joshi (1990:394, 426 ff.) gives the post-Harappan sites here somewhat desultory treatment. About 8 sites are said to have cream coloured pottery of Desalpur I B type; Kotada Bhadli is a large Late Harappan site with profuse red-slipped cream ware, in taluka Nakhatrana; about 40 Early Historic sites date from the first century AD.

6

Enabling Factors and 'Structural Faults'

RELIGION

Whereas Malik (1968:87 ff.) ascribed the 'close cultural identity' of Harappan towns and villages to an integration mechanism that involved largely ideological elements (taboos, values, myths, and, perhaps, world-views), I shall argue that Harappan religious elements may not have successfully sustained the social hierarchies and systems of power. Moreover, Harappan religious elements do not appear to have survived in large measure into the later periods, at least those represented by the succeeding cultures in Gujarat or Sind or lower Punjab, or the Divide—or, indeed, by the hymns of the *Rgveda*. We cannot insist on 'continuities' in social phenomena if evidence for them is missing for long periods in the historical or archaeological record.

While studying the Harappan state structure (Ratnagar 1991: 171-82) I had been vexed by a recurring problem. Even though humdrum objects of everyday use such as flat triangular terracotta cakes, or large parallel-sided blades of Rohri chert and ornaments like shell bracelets and steatite beads are almost ubiquitous at Harappan sites, this cannot be said about objects or representations which appear to express religious feelings.

Second, much has been said about the 'mother goddess' portrayed with a distinctive hair arrangement, and wearing ornate and extravagant headgear and jewellery (Pl. 11), represented by terracotta (never stone) figurines at several sites (though not Amri) in Sind and also at Banawali—but not at Kalibangan, Surkotada, Rangpur, or Mitathal, leave alone in subsequent

cultures. Moreover, Ardeleanu-Jansen (1992) found that the so-called 'mother goddess' figurine is *not* the frequent find at Mohenjo-daro as has hitherto been believed. In the field notebooks of Marshall and Mackay 475 female figurines are recorded amongst a total of 3,335 terracotta figurines (males, females, and animals) and 1,500 stamp seals. Jansen's detailed analysis of the find spots in the HR-B area reveals that more than half of the so-called 'mother goddesses' occurred in private rooms (not directly accessible from the street entrance). Only 27 of the female terracottas were found on the Mohenjo-daro citadel, so that public or private worship there does not appear to have required the use of these figurines (ibid.:12). Thus, cults centred on women may well have existed amongst some Harappans, but not all. Let us recall that in any case this could not have been 'the Mother Goddess of later Hinduism' because there is no single great goddess in Vedic religion who rivals the gods in importance (Shende 1959; Bhandarkar 1995/1913) and the great goddesses like Parvati and Lakshmi appear to have emerged relatively late in the pantheon of South Asia.

There appear, again, to have been 'fire altars' and a ritual involving flames, a central post, and perhaps ablutions, at Kalibangan, Amri, Lothal, Nageswar and Banawali—but not at Mohenjo-daro! The forms of the clay posts and fire pits in any case differ from site to site, and so too their placement (on citadel platforms as at Kalibangan, or within a house as at Amri; Casal 1964:46-7). Bull figurines, further, occur at several sites but not with any obvious iconographic elements. The only symbol with repeated occurrence across Harappan terrain is the mystical unicorn depicted on seals (Pl. 12).

Keeping these factors in mind, I had been led to conclude (1991:182) that instead of a clear-cut dominant ideology at the service of the Harappan state(s), say one that drew on and unified local or regional cults and evolved a pantheon that incorporated the deities of multiple groups, there may have been complexity, perhaps confusion and contradiction as well. The growth of the state need not have occurred in tandem with the emergence of uniform religious practices or ideological control by priests. State emergence may bring about such great social change, crisis, or

differences in social values, that the response is religious pluralism and multiple (diverse) cults.

Let us move now to the famous 'Pasupati' seal (Marshall 1931:Pl. XII.17). It depicts a personage seated on a low stool in what we would today call *baddhakonasana* or, according to Hiltebeitel (1978:768-9), *kurmasana* (Pl. 13). The personage wears a prominent horned headdress, armlets and bangles that cover the arms, something that covers the chest with multiple V-shaped lines, and a double band around the waist. The personage is either a male with the phallus exposed or as Marshall conceded (ibid.:52), it is not a phallus but the end of the waistband that is shown. However, more than one scholar, the latest of them S.M. Atre (1987), has argued that the personage is not male but female. Below the seat are shown two 'deer', their heads turned back. In the spaces to the sides of the personage are disproportionately small figures of an elephant, tiger, rhinoceros, and (?wild) buffalo. There is a six-character inscription above, with a seventh fitted in between the elephant and the tiger.

The identification of the personage with Pasupati was made by Marshall, the excavator of Mohenjo-daro. R.G. Bhandarkar, whose classic, *Vaisnavism, Saivism and the Minor Religious Systems*, was published in 1913 had, however, suggested no link between the Vedic Siva-Pasupati and wild animals like the rhinoceros and tiger.

Marshall thought the Harappan religion revolved around the worship of the great Mother or Earth Goddess (on which we have already cast doubt), and a male deity who was 'a prototype of the historic Siva' (ibid.:52). A major assumption in his thinking is evident: for the interpretation of Harappan symbolic objects Marshall was looking to Hinduism, which was, after all, the one clear frame of reference available to him. He saw the headdress on 'Pasupati' as a *trisula*, whereas a later scholar like Hiltebeitel (1978:771-2) said the headdress was a pair of buffalo horns. (Hiltebeitel also was looking for continuities from Harappa into later Hinduism.) The problem with such an approach is that it denies Hinduism a history, a sequence of change and new elements; in fact this approach, by insisting on all features of Hindu religious practice being already present in the third

millennium, casts Hinduism in the framework of 'primitive' life, ignoring its rich intellectual history. Marshall interpreted several Harappan stone artefacts as *lingas,* and where this seal is concerned, laid emphasis on what he took to be the three faces of the central personage and his 'yogic posture'—yoga was for him a pre-Aryan element. Gauri Lad (personal communication), instead, suggests that the association of Siva with yoga and asceticism is a relatively late phenomenon. It was in the Puranas of the early first millennium AD that the Brahmanas conceived of Siva as a yogi in the ithyphallic posture, in a process in which the linga-worship of non-Brahmanic practice was absorbed. The latter is not evidenced iconographically until about the second century BC. Vedic religion was distanced from linga worship[1] and in the Vedas it was Prajapati and not the male principle who was the Creator.

Marshall maintained that in 'historic times' Pasupati was associated with cattle, but that 'in the Vedic hymns *pasu* signified a beast of the jungle' (ibid.:54). For this latter statement the supporting authority cited is Macdonell and Keith's *Vedic Index*. Macdonell and Keith say no such thing, however.

Vedic Pasupati (*pasupa* in the *Rgveda*) is essentially Rudra, destroyer of grazing cattle (Bhandarkar 1995/1913:145-8; Macdonell 1963:775). This deity, clad like a tribesman in skins and armed with a bow and arrows, is beseeched to refrain from killing cattle and when he turns protector of livestock people call him 'Pasupa'. In the *Yajurveda* Pasupati dwells away from human habitation, is 'in leaves and the falling of leaves' and is the lord of the forest, trees and bushes, and, again, the lord of cattle (ibid.).[2] So, too, in the *Atharvaveda,* Rudra as Pasupati is associated with people, cattle, goats, sheep and horses (Bhandarkar 1995/1913:148; Griffith 1963/1899:141 ff.). Wild animals occur only in the intermediate spaces of a sacrifice. There is thus, to my knowledge, no case for Pasupati as tamer or protector of wild, dangerous beasts of the dense forest like the elephant, tiger and rhinoceros. According to Macdonell (1963:151, 154), beings of the deep forest 'play an insignificant part not only in the *Rgveda,* but even in the Atharvaveda . . .'.[3]

If we can discount this old Sacred Truth about Harappan religion as having been established by a faulty footnote, we may

attempt other interpretations, not necessarily more conjectural or 'speculative' than the worship of Pasupati. Some depictions on seals and copper tablets appear to indicate—as During Caspers (1992; also Ratnagar 1991:171 ff.) has pointed out—that Harappan religion had a shamanistic component. Shamanism is a form of religious practice prevalent among simple (pre-literate and pre-class) societies of hunters and gatherers or agriculturists. It was also known in Shang China, a Bronze Age society. The male or female shaman, the precursor to the priest of the more institutionalized religions, has the rare gift of being able to leave this world of mortals and reach the world of the spirits of birds, animals, plants, or fresh springs, with whom he or she then communicates. The world of these spirits is attained on spirals of smoke, on waves of drumbeats, or through the souls of animals sacrificed on earth. The shaman goes to the spirits to enlist their help in healing people or, say, bringing an end to a drought. Shamans are mystics and 'psychopomps' (Eliade 1989:182) who go into ecstasy as they cross over into other worlds or other levels of consciousness. For them the world of animals is important. Snakes slither between the earth and the underworld, eagles soar from here to the heavens. Animal spirits being their helpers and even alter-egos, shamans often go into the depths of forests to live there in seclusion and concentration until they are approached

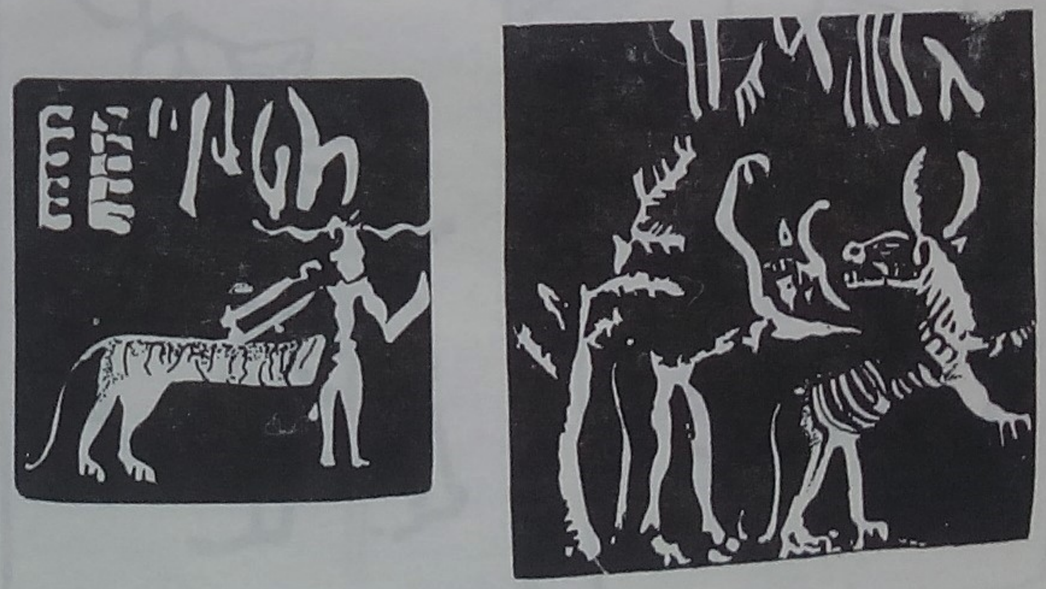


Figure 12. Human-animal personages on seals.

by animals, one of whom they may chose as their companion. This, then, could be an alternate background to the 'Pasupati' seal, especially because the personage wears elaborate horned head gear.[4]

There is yet another seal (Pl. 14), showing a horned and pigtailed person in a pipal tree, someone kneeling at the tree, and a huge animal with wavy horns dominating the scene. The tree could be Life, or the Cosmos which is fertile and perennial (Eliade 1989:271) and therefore associated with women or with animals.

On the copper tablets of Mohenjo-daro are incised, with sharp tools, standardized inscriptions (spells?) on one face, and on the other a hare (one of the swiftest creatures) or other animals or figures such as the leaf-clad 'hunter' with a bow and arrow (Fig. 13). It has been reported (Winstedt 1961:15) that 'In many parts of the world a boy or girl is dressed in leaves to represent the rich vegetation rain is invited to promote.' Among the Indians of northern America (Eliade 1989:102) a 'little green man', only two feet tall, carrying a bow and arrow, was the guardian of the healers.

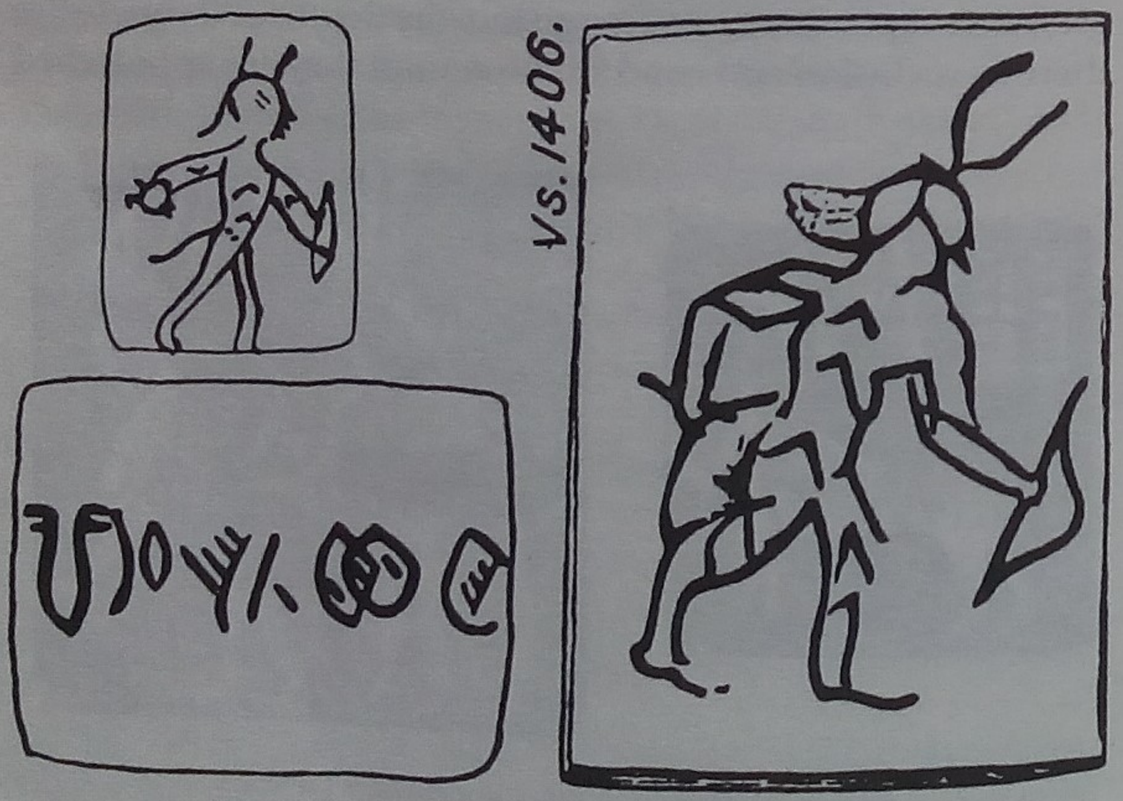
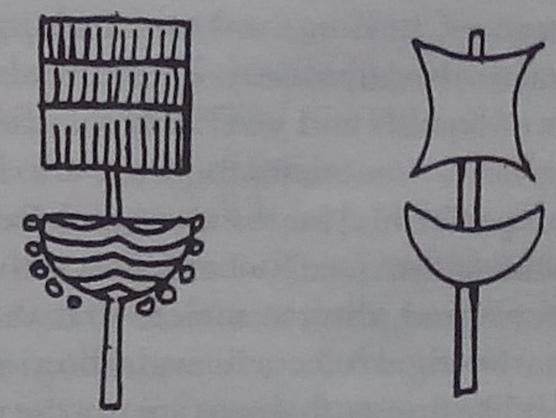


Figure 13. Copper tablets from Mohenjo-daro.

In shamanistic practice incense is commonly used to induce trance; in Central Asia and ancient Iran the smoke of hemp or *bhang* sent the shaman into mystic intoxication. We are reminded of the tall, cylindrical Harappan pots perforated right down their walls, and even more of the 'sacred brazier' or 'incense burner' (Fig. 14) almost invariably shown with the unicorn on the seals. The bronze mirror could also have been important. In Central



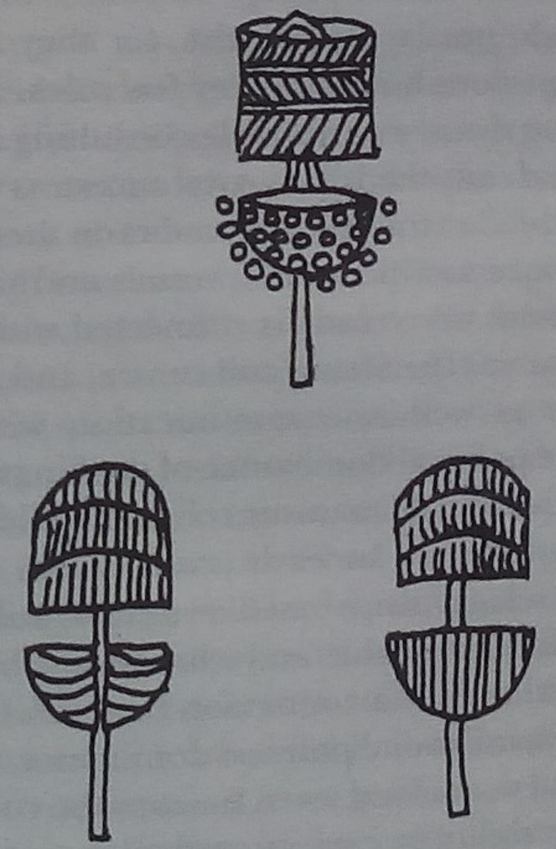


Figure 14. The 'Sacred Brazier' as shown on different seals.

Asia and Ladakh (Basilov 1976; Eliade 1989:151, 498; Kalweit 1992:93) it is used to 'see the world' or the soul of a dead being, or to 'open the door to the world of trance' and be a 'symbol of the world of forms' that has to be transcended (Kalweit 1992:93). This is relevant because the majority of mirrors found in Marshall and Mackay's excavations of Mohenjo-daro occur not on house floors or in street garbage and cached treasures, but in graves (see Rissman 1988:212, 216).

Shamanistic trances, healing, and rain making are never the only religious practices in any society. There are also propitiations of the bestowers of fertility and invariably sacrifice, in one form or the other, is present. Sometimes there are also family cults and deities and rituals performed for the ancestors. But the structural significance of shamanism (see Riches 1994) is that its context is typically a decentralized, diverse society that values individual autonomy and has few rigid rules or heavy institutional injunctions or boundaries. Unlike priests, shamans are not the main sacrificers or overseers of the detailed rules of ritual. They do not preside over harvest rites or *rites de passage* or bestow blessings for the afterlife. They do not lay down rules, for they are themselves unpredictable persons bound by very few rules. True, in Shang China, the ruling dynasty were oracle-consulting shamans. They gave feasts to, and consulted, their royal ancestors who had, in the first place, bestowed extraordinary powers on them; and the first writing (on bronze sacrificial feast vessels and on cattle bones from which oracles were read) is connected with this practice. The royal capital was the Shang cult centre, and sacrifice to the royal ancestors as well as communication with them, gave legitimacy to the political dominance of the kings. However, it is doubtful that a heavily shamanistic religion could give adequate institutional support to an early state system and its social hierarchies and relationships based on mutual utility, or spell out what precisely was acceptable and what was forbidden. Maisels (1990:253-61), who finds a connexion between the ideology of Shang royal shamanism and political dominance, points out that the Shang capital was moved seven times as the rulers repeatedly exhausted their ability to exploit particular areas. (The Shang was thus, for Maisels, a state functioning around cult centres.) Shamanism is less suited to a class-divided society than an

egalitarian ethos with social and cultural pluralism, linguistic diversity, and so on.

VILLAGE COMMUNITIES

When we consider village abandonments it may be relevant that no Harappan temples have been detected. (We would expect any such structures to have regular or recurring features of facade, plan, orientation, or fixtures, and thus be recognizable.) The temple as the terrestrial residence of a god is a comparatively late institution in South Asia. Thus the Harappan religious system appears less like the Mesopotamian, with its scores of buttressed-and-recessed temples with cult statues, libation places, and offering benches, than the religion of Bronze Age China, or for that matter Bronze Age Crete where there were no Minoan temples but where the gods manifested themselves temporarily, as epiphanies, on mountain top shrines or in trees.

The absence of temples, the abodes of deities, may be of particular significance (see Tuan 1977:149 ff.). The house and household of a god can serve to tie a community to a place. Earthbound deities with permanent houses in towns or villages require service. If a ruler builds a temple in a certain place, which then becomes a centre of worship for the local people and for pilgrims from elsewhere, the ruler establishes a particular relationship with a residential community and a locality. A deity comes to be associated with a locality. So, too, certain rituals come to be rooted in certain spaces and it becomes difficult to relocate a sacred space and its associated rituals (Smith 1998).

Temples give their locations architectural, sculptural, or emotional distinction. In contrast, in the Harappan system, we would imagine that no one place had more value than another. Harappan sacred places could have been open-air cult centres or caves symbolic of the womb/rebirth, or sacrificial platforms (as at Kalibangan) which are replicable and dismantled after use, or household shrines which are portable (but for which no evidence has yet been cited), or sacred trees in which deities had revealed themselves to people (trees whose cuttings/saplings could be planted in other places also), but no fixture such as a royal memorial (like the Egyptian pyramid) or institutionalized house

of a great god. It has been observed that the presence of a temple means that it is the place which has primacy. The religious valorization of a space contributes substantially to community feeling among residents (see Bolle 1969). It could be said that if temples mean earthbound deities, they also mean rooted, bounded people. It is also said that those villages are more liable to uprooting and desertion whose social bonds are comparatively weak. Thus I would suggest that the absence of the institution of the temple[5] was one factor that made village desertions at the end of the Harappan period that much easier—there was less bonding of a people to a place and to one another.

Unlike in Mesopotamia, no Harappan town seems to have developed into a cult centre. Around 2000 BC the ruler of Elam (Iran) and his allies sacked the flourishing Mesopotamian city of Ur. Most of its public buildings and residences were razed. The city would never thereafter be a political capital. Yet some time later, Amorite rulers of other city states re-built the temple of the moon god Nanna, the deity of Ur. Then in 1740 BC south-eastern Mesopotamia was again ravaged by Hammurapi of Babylon and subsequently fell into the control of some local chiefs. Again, under later Kassite initiative (around 1400 BC), religious buildings were restored at Ur. The city was not completely desolate. The point to note is that the great and extensive palace of the city that was destroyed in 2000 BC, was in contrast never restored or re-occupied (Woolley 1955:137-50). True, famous Bronze Age cities like Hattusha, the Hittite capital, were deserted in spite of their huge temple complexes, but in ancient Greece, Tuan (1977:151) claims, cities though vanquished in warfare remained viable so long as their temples were intact.[6]

In the absence of private ownership of land and registration of plots, of agricultural marketing, or expensive inputs such as insecticides and fertilizers, and given that in protohistoric times there would have been few people in proportion to the land available, and also that protohistoric subsistence never relied solely on agriculture but also involved the gathering of wild plants as food, fishing, pastoral production, and hunting, we can assume that people were not irrevocably bound to particular villages. Repeated failures of rain could have impelled sedentary

communities to splinter and move afar in search of hospitable environs—and thereby 'disappear' from the archaeological record.

In recorded history famine has been a frequent factor behind evacuations of towns and villages. For the great Gujarat famine of 1630-32, descriptions in the *Mirat-i-Ahmadi* or by Peter Mundy (see *Mirat-i-Ahmadi*; Commissariat 1957; Das Gupta 1995) are graphic and melodramatic (the stench of corpses, mothers eating their children, and such stock elements). But they lack specifics on the speed or completeness of desertions, and it appears that villages remained abandoned for only a few years during a drought. I have also been able to locate accounts of famines—the Punjab famine of 1595-8 (Muhammad Akbar 1974:104-5), and the one in the Central Provinces between 1860 and 1910 (Awasthi 1993)—that did not cause permanent desertion of scores of villages. One can only suggest a very general connexion between Harappan settlement desertions, the introduction of hardy millet crops, and the large numbers of scored goblets.

The cause of large-scale desertion of Harappan cities thus remains a knotty problem. Floods could not have devastated all villages everywhere; and the centuries after 1800 BC probably saw the founding of more villages than had existed earlier. We have also ruled out climatic change as a major factor behind village evacuations. A series of repeated droughts in a particular region *could* have brought about food crises, but I do not think we can bring in 'famine' as a central 'cause' of the Harappan decline. As is now generally believed, 'famine is political', brought on not just by failure of rain but price rise and the inability of peasants to move; their indebtedness and inability to pay for food; exploitative exchange relationships; state demands on the produce or labour of the countryside; the collapse of social institutions, and so on. In the third millennium agricultural produce was not marketed, and there would have been, as we have said, buffer mechanisms such as hunting and gathering of famine foods, and the opportunity to move to animal raising. Scholars are now asking 'why—and for whom—the problem of environmental change arises at all' (Glantz 1987:189). It has also been said that the 'real contemporary issue is whether drought automatically produces

famine' (ibid.:137). Multiple subsistence options may negate the irrevocable bond of a people to their village, but at the same time, may make it possible for people to last out periods of drought in the same locality. In any case, the Harappan settlement map seems to indicate a choice of zones for settlement that were endowed with ground and subsoil water rather than a higher than average rainfall.

We have made mention of bonds that hold the residents of a village together. But there are bonds and bonds. While Bronze Age village groups would have held together because of kinship through common ancestors, group ownership of land, pasture grounds and forests, working and eating together, and common cultural values (see Redfield 1960), this does not mean that we can insist on their innocence, social harmony, or idyllic character (ibid.:134). Tensions, economic problems, distrust and violence, must also have been played their part. While the egalitarian ethic prevailed, in actual life under a state organization, some individuals with more drive and ambition than others could have sought to advance themselves. Tuan (1977:169 ff.) cautions that all residential groups are not necessarily communities: 'houses and streets do not of themselves create a sense of place', he says. Orenstein (1965:308) found that group cohesion is ultimately based on likeness but that likeness also promotes rivalry. He argues that in spite of class and caste hierarchies, the Indian village community of our times holds together because of economic interdependence, the bonds of caste and common residence, the role of village leaders, and also because of conflict within the dominant group (which promotes the need for leaders to seek allies among the subordinate groups and grant them protection or certain rights). We could add that religious festivals involving all residents and the growth of traditions about heroes and momentous events at a place are also important factors (Tuan 1977:167-9). It is likely that in the Bronze Age village people were less dependent on one another than on the state which appears to have organized certain infrastructures for communication as well as the production of pottery, chert tools, and bricks, and distribution of metal or metal tools, as I have earlier argued (Ratnagar 1991:96-105). The planned settlement

of the Harappan period is well known. Harappan residential urban architecture is unique in early South Asia. What if this obviously elite-conceived architectural norm did not conform to people's conceptions of house and home? It has been reported (Tuan 1977:169 ff.) that in modern times it is not hard to uproot the urban poor when they live in homes and neighbourhoods (say state housing or areas abandoned previously by the rich) not of their own design or construction.

Among other factors militating against the endurance of village communities is the question whether Harappan urbanization had occurred at the cost of the countryside. At first thought this may appear to have been the case: for example, at the village of Amri in Sind there is a remarkable paucity of metal. Second, on the west bank of the Indus the two nearest settlements to Mohenjo-daro lie at distances of 25 km (Jhukar to the north) and 52 km (Lohumjo-daro to the south-west), and there appears to have been a paucity of small villages around the great city. But this could also be because small villages did not survive as mounds along the banks of the Indus: on the Hakra plain, we find dozens of small sites in the close—and not so close—vicinity of Ganweriwala Ther. Moreover, on the Hakra plain the transition from the earlier pre-Harappan period to the Mature Harappan had involved (a) a shift of villages downstream, (b) a twofold rise in the settled area, and (c) an increase in the number of villages (see Mughal 1990; Ratnagar 1991:79-80). Thus it is hard to believe that Harappan cities were parasites on hinterland villages or that they flourished as villages withered.

It would, hence, appear that urban collapse would indeed have affected village economies, though to what extent, we cannot say. There are two telling examples, and probably more will surface if we think along these lines. In Balakot, a coastal settlement, exploitation of local sea shells for ornaments did not begin until it was incorporated in the Harappan system (and yielded the material culture remains known to us as Harappan; Dales 1979:257). The reason for this could be that it was only now that bronze saws were available for cutting and fashioning bangles out of thick *shankh* shells, and only now a demand for large numbers of these bangles.

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There is another sliver of information, from Mitathal near Bhiwani in Haryana. In the Mature Harappan level, IIA, when the local Siswal culture continued to flourish together with Harappan weights, ivory, steatite paste beads, etc., the pottery showed a curious dichotomy. There was Harappan red pottery, as always thoroughly fired to a bright red surface and core, but also Siswal pottery which, in marked contrast, had an unbaked, grey core, being inadequately baked (Shaffer 1981:70-2). Obviously the two kinds of pottery were fired in different facilities, and under different conditions, as Shaffer inferred. The important question, however, is why the more advanced Harappan technique was not adopted by the residents for the manufacture of their local and traditional wares.

Diverse strands of information, therefore, seem to point to the conclusion that when the economic and political nerve-centres of the Harappan world went into decline, village life became hard to sustain on the old pattern, and village groups no longer held together as communities.

NOTES

1. It is not universally accepted that *sisnadeva* refers to phallus worship. Following Sayana, neither Griffith nor Velankar say so, contra Monier Williams and V.S. Apte.
2. *Vajasaneya Samhita* XVI.44: 'Homage to him who is in herds of cattle and . . . in cowpens . . .' (Griffith 1899: 141 ff.).
3. Apparently Doris Srinivasan has also made this point (see Hiltebeitel 1978:770) but her paper was not available to me.
4. Another seal (Fig. 12) from Mohenjo-daro (Marshall 1931:Pl. XIII.17) shows a horned personage bending towards a horned animal with raised forelegs. It could be thought that this is a heroic person subduing a wild beast, except that the personage has, aside from horns, long hair, a tail, and the legs of an animal with hoofed feet. It is a person-animal, very much in keeping with shamanistic conceptions. I would thus argue that in the Harappan case—in contrast to the Mesopotamian—horns may not be a sign of divine presence. Meadow and Kenoyer (1997) have published small moulded terracotta tablets from Harappa one of which shows a personage with bangles seated in an enclosure with a bird or animal on each side on the top (Fig. 9.10). Another shows a personage seated in *baddhakoṇāsana* together with a man spearing a buffalo. (Fig. 9.8; see also Fig. 9.11, ibid.).
5. Institutionalized temple worship in developed form as described by Veluthat (1993) is what I have in mind (as counterpoised against systems without temples and their officiating priests).

6. As for South Asia, we often refer to the desolation of the medieval town of Khajuraho. Its last temple was built around 1130 and soon after, Chandella power came to an end. But in 1335 Ibn Battuta found Khajuraho a centre of healing, and as late as the nineteenth century one temple at least was being used for worship. Moreover, even before Cunningham's arrival, local rajas had carried out temple repairs (Desai 1996).

7

The Impact of the End of Long-Distance Trade

It is time now to set the problem of the Harappan collapse in a wider framework and in the world at large. Was the external trade of such importance that its termination would cause the Harappan economy to collapse and undermine the position of the elite? With the agricultural decline of southern Mesopotamia and the military disasters that followed after 2000 BC, the political ascendancy of its cities came to an end. And thus the custom for Harappan goods would obviously have declined. Harappan artefacts are found in southern Mesopotamia up until about 1800 BC. Thereafter, the presence of lapis lazuli, for example, 'declined sharply to the point where it may be suspected that the primary source was re-cycled stocks . . .' (Moorey 1994: 90). But by that time the newly ascendant cities of central Mesopotamia had begun to tap trade and routes along the Euphrates and towards the Levant and the Zagros in place of the sea trade over the Gulf. Even as the cuneiform tablets cease to mention the copper of Magan (the Gulf and south-eastern Iran), references to Alashiya (Cyprus) and its copper (Moorey 1994:246) begin to occur in tablets from central Mesopotamian cities and from Mari on the Euphrates.

Harappan overseas trade involved supplying, to the agriculturally wealthy and densely-populated Mesopotamia (a Centre par excellence if we use the World System model), crafted items such as decorated carnelian beads, plus minerals such as fine wood, gold, and lapis lazuli. Of significance is the fact that few of these items were procured within the Harappan heartland; each was available in a specific and separate source zone. It has

been known since the 1980s that the Harappans procured copper not only from northern Rajasthan and perhaps Baluchistan, but also from abroad—from copper-rich Oman. Moreover, placer tin and placer gold are resources of the lower Kokcha sands in Badakhshan, where a Harappan settlement stood. Tin could alternatively have been procured from rich sources in western Afghanistan. Tin is the rarest of the Bronze Age metals and there were probably no Harappan sources in South Asia. Given these salient features, to what extent was the economy structured on external trade—in the sense of influencing (1) settlement locations, (2) the deployment of labour, (3) the emergence of new routes, and (4) the development of techniques and technology of transportation, mining, and craft production?

In discussions of the external trade of an ancient culture one often comes across categorical statements about its significance (its 'intensity', or its 'network', or, for example, 'a burgeoning network of overseas contacts' (Crawford 1998:51) and even a 'Harappan thalassocracy' (Tosi 1986:106). Suggestions that the trade was sporadic (Adams 1974) or a low-volume transfer of a limited range of goods (e.g. Tosi 1977:64) are relatively few.

One reason for this—and indeed the popularity of 'trade' as a topic of research—is that exotic items stand out visibly amongst the bones, potsherds and bricks that we routinely excavate. When you are in the field they appear, somehow, to be 'finds' of greater significance (you call out from your trench when they show up) than flints or charred seeds. Second, in the 1960s and 1970s there prevailed an unjustified belief that, given time and money, stones and metals could be 'sourced' by laboratories, so that a degree of 'scientific' precision would enter the discourse. Let us take this opportunity to reinvestigate the tools or analytic devices we have at hand for assessing the importance of trade in the Bronze Age.

When one is teaching the Iron Age it is relatively easy to show how the map of the country opens up, as it were, in the later first millennium BC, with new settlements and routes and resources making their appearance. Any number of symbols can be placed on the map to show the occurrence of, say, glass, the synthetic stone of the Iron Age, or gems that originated in the south, or gold, and pieces of characteristic NBP ware as well, to give us an

idea as to how the routes were falling into place and new areas and resources were being settled and utilized. The monasteries and stupas of the early Buddhists were implanted at places where non-agricultural populations were present in sufficient numbers to provide support; so also, Asokan inscriptions would obviously have been located in places of importance, along the more frequented routes, or even the copper producing region of Rajasthan. One thus covers the locational significance of Sringaverpura, Ujjain, Mathura, Champa, Taxila, and Amaravati, to mention some settlements of importance. But it is not easy to do the same for Dholavira or Chanhu-daro or Mitathal, because not even the largest Harappan centres were to become locations of economic importance, pilgrimage, or political advantage in later ages. Neither Harappa nor Mohenjo-daro, to my knowledge, ever stood in the core region of a later polity; no great trade centre developed in close vicinity to them in the ancient or medieval periods. (Only the regions around Ropar and Manda, both outlier sites at some distance from the Harappan heartland, were of substantial importance from, roughly, the Kushana period onwards.)

We can turn our attention to still later periods and probe the grounds on which historians assign importance to the trade between, say, Rome and southern India. In this case there is a great deal of written testimony. Warmington (1974/1928) laid stress on the endless list of utilitarian things like statues, bird cages, ornaments, furniture, combs, etc., that were made of ivory in the Roman world. Following de Romanis (1997) we find that the evidence comprises (*a*) Strabo's claim of a quantum jump in shipping from Myos Hermos to India since Ptolemaic times in the first century BC; (*b*) the Romans' growing knowledge about western India; and (*c*) the famous trade deficit. Specifically, we find that south Indian beryls were particularly prized in Rome; this is collectively and indirectly indicated by (*d*) the rich and large hoards of Roman coins in the beryl producing region of the south; (*e*) references in Latin literature to the popularity of beryl with women, including observations that one did not need to set beryl in gold—it was beautiful enough in itself; and, quite significantly, (*f*) the fact that beryl jewellery was necessary for the

cult of Isis. Most of these indices, we note, come from textual records; in our case documentary evidence is available from only the Mesopotamian end of the trade circuit.

To begin, I propose that little is gained by debating whether ancient trade was in 'utilities' or in 'luxuries'. The argument has been that before the advent of modern and low-cost transportation, only 'curiosities, rarities, and luxuries' would be carried great distances, not humdrum things of everyday use. Luxury trade does not entail a regional/geographic division of labour, and on that account was considered unimportant, even though rarities and their consumption and control were necessary for social status in polities with a low level of surplus extraction. It was further argued that 'curiosities, rarities, and luxuries' were transferred more as tribute/gifts than as commodities.

Yet, in the Bronze Age, other than culturally valued materials like lapis lazuli and shell there were also rare metals—copper, tin, arsenic-copper, and lead—that were procured by riverine civilizations, often from appreciable distances away. This is in marked contrast to the utilization and reliance on iron, a more widely available metal, in the first millennium BC.

Moreover, in which category would we place bronze, if not only fine pins, ritual mirrors, and heavy bangles were made of it, but also chisels and razors? The decorated beads that found their way into royal burials in Mesopotamia were certainly not utilities in our sense of the word, but did they have only luxury value, or were they in some way symbolic items? To what extent should we distinguish a luxury item from one with symbolic value? Consider, for example, a recent discovery at Tell Brak in northern Mesopotamia. Oates and Oates (1993:161 ff., Figs. 12, 13, 45-7) found an impressive ritual deposit there, in an Akkad-period temple. It comprised several bronze chisels and flat curved blades with tangs, clearly tools, but also pieces of silver and ornaments of carnelian, gold and lapis lazuli. In the act of ritual deposition, obviously, no separation had been made between bronze tools, silver ingots, and jewellery. The jewellery was 'almost surrounded by' the bronze tools, and the latter were 'standing upright in the soil as if they had been contained in a cloth bag' (ibid.:164).

Thus statements that contrast trade in necessities with high-

value items are often inaccurate, or worse, fatuous. The only occasion on which we would be suspicious of the significance of trade would be if there was a hint that the traded items were nothing but curiosities that pandered to the greed of the elite, of the sort revealed in the autobiography of Harkhuf, an official of the Sixth Dynasty of Egypt of roughly 2250 BC (A. Gardiner 1966:58-9). This official was prodded, indeed beseeched, by the young Pharaoh to deliver up safely to the capital a 'Deng of the gods' dances', which the early Egyptologists translated as 'a dancing pygmy'. All kinds of favours were promised Harkhuf by the Pharaoh if this were accomplished.

Therefore, it would be better to focus on a conceptual distinction between the economic parameters or weightage of trade on the one hand and archaeological measures of this weightage on the other, though the latter would be proxy measures at best. Where the first, economic significance, is concerned, we could also distinguish the impact of commerce with distant regions on production, raw material procurement, transportation mechanisms, and labour on the one hand, from repercussions or secondary outcomes (such as the transfer of technology or an exchange of ideas) on the other.

The theoretical background to the argument that follows is that the Bronze Age economy was not a pale or inchoate version of our own, but qualitatively different. Like the village, agriculture, class, caste, writing, and navigation on the high seas, so too the market as an organizing principle came into existence at a certain juncture in history and is not a pre-existing condition of human activity. The items that were exchanged across the Bronze Age world would certainly have functioned as commodities—items for which there is demand and which thereby have exchange value, which depends on their valuation against other items—in some ways, but this was not a world of commodity production. So irrelevant would have been the commodity value of etched carnelian beads in Mesopotamia, for example, that they were deposited in the graves of the elite. A commodity in the true sense, in a commodity economy, would have been used or consumed (worn in this case) and/or re-exchanged against something else.

In any case, there is much evidence from contemporary Egypt and Mesopotamia, structurally similar Bronze Age societies that have left behind voluminous written documentation, that land was not private property in the third millennium BC (Gelb 1979) but was for the most part owned by kin groups. Land had begun to be acquired for the temple or palace, and its produce utilized to benefit the elite, but this appears to have been quantitatively limited. Taxes in grain on rural landholdings are totally missing from written records and one surrendered to the king or temple one's labour, which in Sumer was in turn compensated with rations (amounts standardized according to age and sex) of barley, oil, and clothing. But there were no wages, and no payments in silver for the duration and skill of work. The schism between the rulers and the ruled was, therefore, not based on ownership of landed property.

There would have been few merchants doing business carrying items from zones of abundance to where they were scarce, to live on the profit margins thereof. Instead, Mesopotamian and Egyptian narratives describe specific-purpose expeditions dispatched abroad by rulers or temple authorities for the acquisition of required amounts of wood, stone, or metal. Perhaps this is why there is a heroic tinge to many of the trade venture narratives in both lands.

Correspondingly, in such economies it is expected that internal trade in the sense of marketing would certainly have occurred, but was not the grid or ordering principle of production and exchange. That is why we find that the largest Harappan cities do not emerge in the densest clusters of villages (take Dholavira, for instance); that the floor space of the Lothal storage structure was larger than that of its counterpart at Mohenjo-daro, although the latter is by far the larger settlement (Ratnagar 1991:123-4); or that the exploitation of marine shell for craft production (bangles in particular) began at Balakot not in its earliest period but only in the Harappan. Decades earlier Gordon Childe had sensed that the key feature of Bronze Age economies was their orientation to the needs and tastes of the elite, and their dependence on elite organization and control, specifically on trade expeditions, the sponsorship of key crafts, and the infrastructural arrangements

these would have required. Much of the material culture of the elite that we find in royal graves or cached away as treasure in urban houses could be termed Wealth (in contrast to commodity), material with intrinsic value that made 'social statements'. Wealth items were endowed with worth in such a way that their exchange was not a matter of five ivory combs being equivalent to, say, two bronze chisels. The two were possibly never exchangeable. In exchange or bestowal of Wealth, the social roles of the giver and receiver had greater importance. Such exchanges created or strengthened the political or social relationship between the giver and the receiver, and perhaps simultaneously, there was implicit appreciation of the colour, texture, substance, or even history of particular stones or metals or crafted objects, and their association with particular values.

Thus far we have maintained that the importance of Harappan overseas trade is far from self-evident; that its significance is analytically distinct from secondary repercussions of long-term engagement in trade; that we can productively investigate the issue only by setting the trade in the context of a pre-market system; and that distinctions between trade in luxuries and utilities do not take us very far. Let us now turn to the quantum of trade, the distances merchandise was moved, labour inputs, and the cultural value of things that were carried such distances.

Can we suggest that the quantities of materials that moved long distances are an indicator of their economic importance? Bulk items like wood, metal, or textiles create problems of transportation; we assume that large amounts were moved across regions only if important—and that importance could be economic or technical but also cultural or social. The chance survival of these goods in archaeological remains can only direct us to particular sorts of questions. For example, in the eastern Mediterranean and western Asiatic Bronze Age there were copper ingots weighing more than 30 kg each; the 'oxhide' ingots of Minoan Crete and Cyprus weighed between 30 and 38 kg (Tylecote 1992:35 ff.). In Shang China one artefact alone weighed 875 kg (Chang 1980:37). But two ingots from Mohenjo-daro weighed 623.7 and 1007 gm respectively (Rao 1985:524).

It is the documentary evidence in Mesopotamia that gives us an

insight into the scale of the trade. For example, 6,400 tons of wool could be shipped in a single temple transaction; one text features a consignment of 2380 KUR of barley (thousands and thousands of kilograms) to Magan; tithes paid to a temple after completion of a journey to Dilmun for copper could amount to 18,000 kg, if our understanding of the Sumerian weight system is correct (see Ratnagar 1981:79-95).

For the rest, archaeological bits and pieces such as the Mohenjo-daro ingots tell us little: the archaeological record, in some cases, may turn up a very minute fraction of the goods actually on hand, whereas in other cases it may embody a fair proportion of the whole. The day-to-day garbage discarded by ancient people cannot reflect their entire material consumption, because valuable or attractive or costly items, not to speak of sacred statues or relics, will be cherished by successive generations of people as heirlooms and enter the archaeological record only if lost by accident or abandoned during flight, or if interred with the dead or in temple foundations/deposits. There is an additional difficulty. In Mesopotamia, death rituals for the elite were lavish in the use of metal, stone, shell, and other materials. But there appears to have been no parallel to this practice in Harappan ideology; the known graves have very few kinds of furnishings (see Rissman 1988). Absence of temple building in South Asia, on its part, ensured that at the Indus sites we would find no ritual caches or foundation deposits to parallel those at Brak.

As an alternative to 'quantity' we could ask whether the distances particular items moved were not a measure of their cultural value or economic role. True, we find items from afar in cultures that cannot have been trading cultures at all: obsidian from two sources in Anatolia is known across a large number of very early neolithic sites of western Asia, for example. Similarly, at chalcolithic Atranjikhera in the Doab and at Prakashe in the Tapi valley charcoals of trees have been identified which botanists say could not have been part of the local natural vegetation. So distance by itself may not be a measure of the role of trade.

Yet, let us consider the enormous distances lapis lazuli travelled, from its Badakhshan and/or Chagai sources to Egypt, Syria, southern Mesopotamia, the Gulf, Turkmenia and South Asia. It

was not just distances in kilometres either. Chagai is extremely inhospitable and barren, today the site of nuclear tests. The lapis along the banks of the Kokcha has to be quarried in the freezing temperatures of winter, and is accessed only after a truly arduous trek far upstream, along steep paths and over dangerous bridges across chasms. (No pony can carry one all the way to the quarries.) John Wood (1872:165-72) reported that accidents were frequent during the quarrying.[1]

To add to our argument that people would not have made arduous journeys to procure lapis lazuli unless the imperatives were strong, we may consider the evidence from Shortughai, established near the Kokcha-Oxus confluence. Francfort (1989:250-5) shows that in level 6, mound A, which was the earliest occupation of the village, there occur traces of lapis cutting together with substantial architecture, canal irrigation, carnelian, *shankh* shell and metal crucibles. In Harappan levels traces of lapis flaking occur all over the excavated area, but they are concentrated in two spots. After the Harappan period, in level 2, there is no lapis. There is little cause to doubt, therefore, the role of this village as an outpost established for the procurement of this precious stone, and, perhaps, also tin and gold.

Reinforcement of our argument for the immense cultural importance of lapis lazuli to the peoples of the third millennium comes from Mesopotamian poetry. This sky blue stone was a gift from Anu, the sky god, to Inanna, the goddess of love and fertility. '. . . small lapis lazuli beads she hung around her neck; with yoked oval beads she covered her chest. . . .' (Jacobsen 1987:216). The stone had celestial qualities and divine associations. In the story of Inanna's descent to the netherworld, Dumuzi (her husband) is condemned to take her place there for six months in the year. The news of this decision of the gods is conveyed to Dumuzi's sister, the goddess Belili. She is seated stringing her beads when she hears the lamentation for her brother; she starts, and the beads scatter from her lap. Oppenheim (1950:42-3) believes this is an aetiological fragment explaining why the sky blue stone, potent and life-giving, is found under the ground.

The amount of effort, labour, or skill put into the manufacture of an item may also be a measure of its importance. By this token

the dispersal of chert blades across the Harappan area would be a different matter from the spread of bangles of *shankh* shell. Dozens of chert blades could have been struck off prepared cores in the course of a day, in the Rohri hills. But the shell would first have to be retrieved from the seabed and then cut by people who had the right equipment and the requisite know-how. Would it be ethnocentric to assert that the greater the proportion of labour-intensive items that moved, the greater was the economic significance of the trade?

Attention needs to be given to the role of faience, the substitute stone of the Bronze Age. Many Bronze Age cultures had their own faience techniques and various kinds of ornaments were made of it. It is of interest that this material does not seem to have been traded across western Asia to South Asia or vice versa. While the basic technology was the same over the third millennium Bronze Age world, details of content and production procedure appear to have been specific to each of the civilizations (see Dales 1991:68). Second, amongst the splendid items of wealth in the Royal Cemetery of Ur, including literally thousands of beads of gold, silver, carnelian, and lapis lazuli, musical instruments made of wood and rich materials, art work in inlay and sculpture, gold drinking cups, and gold ceremonial weapons, faience is inconspicuous with only about twenty beads of 'frit' or 'glass paste' (Woolley 1934:369). According to Moorey (1985:145) only two Royal Tombs contained faience ornaments. Obviously, no synthetic gem would do for royalty.

This reminds us of a remark of Keynes reported by Childe (1964/1942:123), that today it would not make sense to lay two railway lines between London and York, but that two pyramids were twice as good as one; that materials like crafted shell items, ceremonial gold weapons and brilliantly coloured stones did not 'stale with abundance'.

We could also consider circumstantial evidence for the cultural significance of traders, foreign persons, seafaring, ships and their designs. Harappan glyptic and pottery painting does not lavish attention on ships in full sail or on constellations of the stars in the skies. But we know that the categories of non-verbal information the seal image would have sought to convey is not likely to

incorporate aspects of a sailor's life. Few potters, probably, had the chance to go to sea. And copper tablets seem to have had a ritual function that makes 'trade' an unlikely subject for portrayal on them. However, the profuse terracotta and faience art is telling. It depicts women at their household chores, ceremonially coiffured women, a wealth of animal life, wheels and cart bodies, even a dirty old man (I refer to a terracotta displayed in the National Museum of Pakistan, Karachi), but rarely ships.

Concerning circumstantial evidence for the intensity and frequency of trade (and for that matter other kinds of) encounters, we could look into the repercussions of cross-cultural interaction. Was there much exchange of knowledge between trading groups? We find that metallurgical traditions of, say, Turkmenia and Hissar, with their emphasis on three-metal alloys, are quite different from those of Mesopotamia and the Harappan world. At Shahr-i Sokhta and Mundigak micro-drilling was the technique used for carving seals, but not so in Turkmenia (even though the seal forms were similar; Kohl 1977:114-18). Stone masons in Bahrain (Doe 1986:188) do not appear to have known about the load-distributing 'English bond' that the brick-layers of Mohenjo-daro had mastered.

Yet the popularity of the coloured synthetic stone, faience, had spread over the Bronze Age world, with differences only in detail (Dales 1991:68; Højlund and Andersen 1994:392). The glazing of steatite, for which Harappan sites are famous, was known also at Mundigak (de Saizieu and Bouquillon 1993) and Bahrain (Højlund and Andersen 1994:319 ff.). There is also the famous case of jowar, probably first cultivated in the Yemen, later possibly in the Oman peninsula and then in the Kacchi and in Kathiawad (although in historic India its importance is not attested in inscriptions or in literature until the early Christian era) and the not-so-well-known case of about thirty bones of the Indian humped cattle on Umm an Nar island in the Gulf (Cleuziou 1984:393). And for good measure let us also recall the opinion of Asko Parpola (1994:314) that the creation of the Indus script was an outcome of the first encounters of the Harappans with a literate civilization.

Moving on to the place of trade in the economic structure, it is

Harappan material that we find in the neighbouring cultures of South Asia of the third millennium BC, at sites like Burzahom or Kayatha, rather than the other way around. This is to be expected. It would have been the technologically more advanced, socially more heterogeneous, and economically expanding social entities who would venture out to begin exchanges with less sophisticated groups. Harappan graffiti, storage jars, weights, combs, etc., are found as far afield as the peninsula of Oman, in the copper bearing localities and other areas. That those were Harappan copper procurement missions—analogous to Pharaonic expeditions into the eastern desert, or Mesopotamian Jamdat Nasr-period expansion into Oman—are the obvious inferences we would make from this spread of Harappan material.

The evidence of seals, weights, and writing, as well as Mesopotamian literary references to the Meluhhans, their boats, wood and carnelian, indicates that it was the Harappans who were sailing into the Gulf, and not the Mesopotamians with their greater agricultural productivity and population densities who ventured into the South Asian seas (Ratnagar 1981). The explanation may be that Mesopotamia lacked the timber for developing a ship building and maritime tradition but we do know that over the centuries various coastal regions of the Gulf have had boat building groups dependent on the west coast of India for supplies of timber. Also, in the archaeological record, Harappan materials are more visible at Mesopotamian sites than Mesopotamian material in South Asia. It does not necessarily follow that South Asia was a kind of periphery supplying stones, metals, timber and crafted goods to the Mesopotamian 'core', for the Harappan heartland was itself and in its own right a core taking in raw materials from as far north as Badakhshan, as far west as Oman, as far north-east as the Shivaliks, and perhaps as far south as the Raichur doab.

Harappan trade initiative would have involved setting people to dive for shells and quarry stones, to construct carts and build boats. Forestry and skilled carpentry would have developed as 'auxiliary industries'. Towns like Lothal would have acquired a role as goods collection and transportation nodes. A station like Ropar could have been founded to make feasible the procurement

of logs and metal from the Shivaliks. Meanwhile, it would have been necessary to manufacture weights at a centre like Chanhu-daro. Thus, we cannot deny the role of external trade in production and the division of labour. We are tempted to infer that trade did have a critical place in the development of the Harappan economy.

What did the elite of Mohenjo-daro or Harappa gain by engagement in trade with Mesopotamia and Dilmun, other than high quality Mesopotamian textiles, silver, mother-of-pearl and pearls from the Gulf, and the occasional elaborately carved (and presumably charged with meaning) stone container? We have seen that Harappan elite consumption patterns have left no trace in the archaeological record. Yet, we could surmise that valuable silver vessels and ornaments of gold/silver and exotic stones were part of the socially distinct lifestyle of the rulers. Consider, for example, the find of a Harappan chert cube weight, 13.5 gm, at Ur III-period Ur (Ratnagar 1981:185-6). This find seems to say that someone was weighing low bulk items in Sumer for dispatch to South Asia—not textiles or edible oil that are mentioned in the cuneiform texts, nor yet simple curiosities which would not be weighed. So also, no gift from a Mesopotamian ruler would have suffered the indignity of being weighed! Obviously high-value items were being brought back by traders, of which little survives at Mohenjo-daro and Harappa.

Yet, at the same time, we need to assess the role of imported copper and bronze in Harappan economic life. If we consider the range of metal tools at the different sites, we find that small settlements like Lothal were rich in metal tool types, even if Amri was not. More important, craft towns like Lothal and Chanhu-daro had metal tool types comparable in range of form to those recovered at Mohenjo-daro (Ratnagar 1991:98-100) even though they were small settlements.

Let us consider the use of bronze and copper tools (Pl. 15) in the spheres of subsistence, transportation, accessing metals and materials, craft production, house building, the digging of wells, tree felling, and warfare. Some of these spheres could have become dependent on metal technology, and hence on a system of procurement of copper, arsenic-copper, lead, and tin or copper alloyed with tin, from different regions.

When we take subsistence, we have a confused picture (see

Table 1). There are bronze fish hooks aplenty in Harappan assemblages, but we cannot rule out the role of nets and traps in river and sea fishing. Fish nets are painted on a pot from Harappa (Vats 1940: Pl. LXIX.16, p. 289 describes this as 'a fisherman carrying two nets suspended from a pole across his shoulders') (Fig. 15). For hunting there were swallow-tail arrowheads of bronze, but also sling-stones of clay and perhaps stone. Yet, flint arrowheads are very rare at Harappan sites: to my knowledge there is a solitary example at Harappa and one at Shortughai and no bone arrowheads of the sort one finds at Atranjikhera. This is significant considering that flint and bone artefacts have a higher rate of discard and thus a better chance of being incorporated in the archaeological record than do bronze objects.

To clear land for agriculture we expect that axes for felling trees, hoes, spades and shovels would have been needed, and these are not easy to identify in the artefactual remains. The almost total absence of not only metal sickle blades but also ground stone axes and adzes at Harappan sites is puzzling. These would have been used not only in agriculture but for felling and splicing trees and their trunks, for making rafters for ceilings of houses, for boats and for carts. While very large numbers of stone querns, grinding stones and whet stones have been found, no ground stone axe or adze is reported from Mohenjo-daro, Lothal,

Figure 15. Fisherman with net painted on a pot from Harappa.

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TABLE 1: USE OF METAL TOOLS

kind of economic activities in which metal tools were used	*activities for which metal tools were not necessary*
ploughing (for manufacture of plough)	pastoral production
fishing (bronze fish hooks)	fishing (nets)
hunting (bronze arrowheads)	hunting (flint tools)
warfare (sword, lance, dagger)	warfare (stone mace-head, terracotta missile)
ritual items (mirror, copper tablet)	ritual (sacrifice, ablution, immersion, chant, circumambulation)
fine ivory work	
shankh shell bangles	ordinary shell bangles
hard stone bead drilling (with abrasive)	
steatite block cutting	house construction
seal carving	textiles and matting
uncertain	
tree felling	
roof-beams and roof construction	
well digging	

Chanhu-daro, Harappan-period Shortughai, Rangpur, or Surkotada; only two or three seem to have been found at Harappa. Again, ground stone artefacts have a higher rate of survival in the archaeological record than do metal ones. True, ground stone tools are more likely to have been both made and utilized out in the countryside than in a house in Lothal, and would therefore be underrepresented in town debris. At chalcolithic Navdatoli for example (Sankalia et al. 1971:323 ff.), only one ground stone axe was found, in contrast to 338 hammerstones. However, other chalcolithic sites have produced respectable numbers of them. For example, there are dozens from Tekkalakota (Nagaraja Rao and Malhotra 1965:55 ff.), and at chalcolithic Inamgaon (Dhavalikar et al. 1988: 527 ff.) 71 dolerite celts were found, 40 of these from the surface of the mound. If ground stone tools had been in regular use we would have found a sample of them at one or the other Harappan site. Therefore, it could be argued that

paucity of metal clearance tools in Harappan mounds is a factor of metal re-use, but a paucity of stone tools would indicate instead that stone axes were not in frequent use.

We can expect that ploughs and their shares were of hard wood or bamboo, which is a reasonable assumption given the nature of the pre-modern plough in much of South Asia, and the shape of the plough clay model from Banawali (even though some massive, roughly-shaped, flint blocks have been displayed as ploughshares in museums in Pakistan). Much more problematic is how the Harappans dug wells and ditches for irrigation and wells for the urban drinking water supply at cities like Mohenjo-daro; several wells in the latter city are exceptionally deep and strong, shovel-like tools must have been necessary. As for harvesting tools, sickle blades of metal are almost entirely absent but asymmetric stone flakes (lunates) together with long chert blades are reported from Lothal and also from Chanhu-daro, Harappa, Rangpur, and Surkotada.

On the whole, the list of metal agricultural tools presents a stark contrast to those found in Mesopotamia. True, there too metal implements for agriculture are rare because of the contingencies of archaeological record formation. But an unusual hoard of agricultural tools (Moorey 1971) dating to 1800 BC has been found at Tell Sifr. It included new and used tools deposited in a state workshop together with dated cuneiform tablets. There is no ploughshare but a heavy shaft-hole axe and a superbly made mattock with a shaft hole are present. There are also adzes and winged blades, split to fit onto wooden spades as 'shoes', sickle blades, bill-hook blades, and two- or single-edged knives. Very few of these tool types have any parallel in Harappan assemblages.

By the same token it may be inferred that some tools used for house building—digging foundations, brick making, brick laying, and roof laying—were made of metal. Ceiling rafters over 4 m long that were utilized at Mohenjo-daro would have had to be accurately spliced. But until we excavate a hoard of such tools, we will not know for certain.

The evidence for warfare is interesting. Harappan bronze weaponry is noticeably poor as extant. There are arrowheads and lanceheads, but it is maintained that the daggers and spearheads, lacking strengthening midribs, would have been ineffective

without appropriate hafts. Yet, the stone maceheads found in number at Mohenjo-daro and Chanhu-daro (probably made at the latter site) are known to make formidable weapons for close combat (the instruments of Kennedy's 'thumps on the head'?). Let us not forget either that effective use can be made, during the siege of towns, of missiles of stone or baked clay (Pl. 16). Even in Mesopotamia, where metal weaponry was in use with a range of advanced forms like the shaft-hole axe, dagger, and spear, these missiles were important. A Sumerian narrative tells us that when the army of Uruk was laying siege to the foreign city of Aratta, the men of Uruk had to fling themselves down because 'from the city darts rained like rain; from Aratta's walls clay slingstones came clattering as hailstones come in spring' (Jacobsen 1987:336).

Perhaps it was in Harappan transportation and craft production that metal tools were indispensable. As Childe was the first to point out, the effective plough, wheeled cart and plank boat are all products of advanced carpentry which is not feasible without saws, chisels, and gouges. Such shapes, in turn, are possible only in metal.[2] True, stone is not as useless a material for carpentry tools as we would think. H.D. Sankalia (et al. 1971:264ff.) experimented with serrated chalcedony blades and flakes on seasoned teak and found them effective for both smoothing the surface of the wood and cutting through it. The seasoned teak used for the experiment was in the form of blocks 15 cm thick, but for making ploughs or cart frames or ceiling rafters or the masts of ships as well as ship hulls, massive, heavy-duty tools would have been necessary, and in default of a ground stone tool kit, we assume that these were of metal.

John Wood (1872:171) has reported that the lapis lazuli of the upper Kokcha was quarried with the aid of fire to make the rock surface crack, but deep grooves had then to be cut around the exposed blocks of lapis and these had to be gouged out with the aid of metal crowbars. Copper ore rocks were presumably also extracted from the ground with the use of heavy-duty levers.

Major Harappan crafts like steatite seal carving, shell bangle and ladle production, ivory carving, and stone bead manufacture are known to have required metal tools. Dales and Kenoyer (1977) found that bangles of the *M. casta* or *T. damoides* shell

required stones, stone anvils, sand, water, and flaked stone blades for engraving, but that the thicker conch shell would first have to be sawed through with bronze implements before bangles could be fashioned from them. Where stone bead production is concerned contrary claims have been made. An undated brochure produced by the Museum of Archaeology, University of Baroda for an exhibition of Gujarat's agate and carnelian industries through the ages, records evidence of saw marks on semi-precious stones at Harappan sites. Sawing would have required an abrasive (say the dust of quartz/carnelian/agate) for agate and carnelian are harder than copper or bronze. Adequately shaped tools and abrasives would have been required. Known tools for bead drilling include flanged or collared bronze drills as at Chanhu-daro, or 'pencil-point' drills as at Mohenjo-daro, Lothal, Shortughai(?) and Surkotada and also Chanhu-daro, as well as tubular drills which have been found at Mohenjo-daro.

It has also been said, however, in the brochure mentioned above, that the use of very small tools of green jasper, 'rich in a hard mineral called titanium', is effective. These tools can drill very long stone beads, although with much effort and time. However, in their experimental study, Gwinnett and Gorelick (1987) came to a very different conclusion, namely that stones with a hardness between 5 and 6 on Mohs' scale cannot be drilled with flaked stone implements even if an abrasive is used, because the latter will also change the shape of the drill. They state that the drilling of hard stones is possible only with bronze drills utilizing emery (not quartz sand) as an abrasive, together with oil and water. Barthelemy de Saizieu and Casanova (1993) report that the flint/phtanite drill heads found at Chanhu-daro, Mehrgarh, and several other sites were too thick (around 3 mm) to bore through quartz or chalcedony. Bronze rods, however, as thin as 1.8 mm, have proved effective. At Mehrgarh, one such rod was actually found embedded in a broken lapis lazuli bead. The durability and availability of the green jasper drills is a matter that should be further explored. Another angle that has been emphasized (ibid.) is that lapis lazuli rocks do not cleave easily when flint-knapping techniques are used. The stone lacks a conchoidal fracture, and if struck with another stone may explode

into fragments. Thus it needs to be initially sawed, but if flint microliths are used for the sawing, they soon lose their sharpness (ibid.).

We have referred above to ivory, mentioning its special qualities. To carve this material accurately, one could soften it by wrapping it in wet cloth for days but it would still require fine and sharp ended metal tools like saws of varying widths, small drills, gravers, chisels with bevelled ends and small adzes (Burns n.d.; *Census of India* 1961; Webster 1994; Moti Chandra 1957-9; Dwivedi 1976). In fact, marks of sawing and drilling are visible on Harappan ivories (Marshall 1931:562; Mackay 1938:579).

Last, if textile production in Harappan settlements did not require metal, and spindle whorls are found in several other materials, perhaps the potter's wheel was a wooden one and also the output of skilled carpentry.

The foregoing is only a survey in the absence of systematic research. We need, in addition, to find appropriate methods of investigating the relative functions of flaked stone, ground stone, bone, and terracotta in Harappan technology, so as to be able to place metal in a reasonably complete perspective[3] (see Table 2). It is puzzling, for instance, that bone, whose elastic properties and hardness on heating have been commented upon by Joshi (1990:345 ff.), and which was used for arrowheads, awls, borers, and scrapers at Surkotada, is evidenced at that site only in 44 tools (ibid.), in contrast to 129 copper/bronze artefacts plus a hoard of bronze ornaments (ibid.:266).

Unfortunately, we have no reliable internal chronology of the Mature Harappan period that would enable us to take the lead from Edens (1992) and find out statistical means of assessing copper/bronze consumption through the period, and the expanding uses—if any—to which metal was put. Going by studies of cuneiform documents, Edens (1992) found that during the third millennium, in Sumer, copper gradually became an industrial metal and its use expanded, replacing, for example, stone sickle blades. This could have been the case in South Asia also. In the previous period metal had been scarce: even at the extensively excavated site of Mehrgarh, it is noticeable by its paucity. More important, the range of tools in metal was limited. A study by Cleland (1986), which considers metal in the Indus

TABLE 2: USE OF TOOLS OF STONE AND BONE

Ground stone axes and adzes

Found at Shortughai, a very few at Harappa (small tools), not reported at Mohenjo-daro, Chanhu-daro, Rangpur, Surkotada, or Lothal

Querns, mortars, pestles, whetstones

Occur at most sites

Flaked stone tools

Large parallel-sided chert blades ubiquitous; several flake/core tools and microliths, but scarce: is this a factor of artefact recovery in the trench? Harappa: one flaked stone arrowhead reported; Shortughai also, one flaked stone arrowhead; Chanhu-daro: one denticulate 'saw' blade of small size and drill heads; Shortughai, Surkotada, Rangpur: flaked stone points.

Bone tools

Chanhu-daro	:	awls
Mohenjo-daro	:	awls, needles
Surkotada	:	awls, engravers, scrapers, points, burins
Lothal	:	26 long, pointed awls; engravers; a spatula; scrapers used by weavers; an arrowhead
Harappa	:	not discussed by Vats. Awls and points illustrated Pl. CXIX.
Shortughai	:	large and small pointed borers, awls, arrowheads, hafts
Rangpur	:	not reported by Rao

world in the context of changes in the stone tool kit, finds (p. 110) that 'As copper-bronze tools became more frequent, the frequency and functional variability of chipped stone tools declined.' It is the greatly restricted flaked stone tool kit at Harappan sites which is of special significance.

Critically important as a gauge of the 'structural' importance of trade would be the long-term repercussions of engagement in trading by a peripheral region, one that was a source of stones, metals, or wood. Can we say that, as an outcome, regions like Badakhshan, the Shivaliks, or the valley of Kashmir came to utilize local resources to their own advantage and saw cultural development beyond the limitations of the neolithic? To date the evidence does not permit any such conclusion. It has often been

remarked that the copper-producing peninsula of Oman, in contrast to the trading archipelago of Bahrain, saw little indigenous movement towards cultural/social complexity and experienced a kind of dark age after about 1700 BC. We may add that we have no evidence either for the continuance of Harappan traditions of cargo-boat building or long-distance sailing or navigation into the second millennium.

The problem of the economic and cultural importance of trade in the Harappan system merits much more extensive enquiry. For the moment, however, my conclusion is that trade is vitally relevant to the character of the Harappan civilization, and, thereby, to its disintegration.

NOTES

1. Stech and Pigott (1986:46) report the occurrence of a single river-borne and rolled pebble of lapis at Shortughai, which could indicate that the stones were picked up near the village and that no upstream trek was needed. But if that were so one wonders why lapis pebbles are not reported in the bed of the lower Kokcha today.
2. The carpenter's tool kit in contemporary Egypt (Aldred 1954) comprised the drill with a copper bit, chisels, adzes, small axes, saws, abrasive, awls and also wooden mallets and hammers.
3. To cite just one example, while needles and awls of bone are known in Harappan sites, they also occur in bronze, and also, at Mohenjo-daro, in gold.

8

External Events that Triggered a Collapse?

THE 'WESTERN FLANKS'

External factors ate not limited to overseas trade. There was a series of village and town abandonments, as well as other group movements, over a large zone to the west of the Harappan area. These areas were the Kopet Dag foothills (Turkmenia) and the delta of the Murghab (the region of Margiana) to their east; Bactria, north and south of the Oxus; north-eastern Iran (east of the snow-clad Elburz and their junction with the low Gurgan plain, with the Turkoman steppes further north); and a wide zone flanking the Dasht-i Lut on the west and running south towards the Hamun-i Helmand, along which lie some rich sources of tin and copper. Once we get to the Hamun-i Helmand, the land is covered with either marsh or salt flats and, further south, especially in the Gardan Reg, lies a region of sand dunes that is particularly inhospitable—but rich in copper and also marble, where astonishingly extensive remains of early metallurgical activity have been found.

Let north-eastern Iran, the logical starting point from the perspective of historical geography, also be ours. In the valley of the Gurgan river, which empties into the Caspian Sea, lay the third-millennium sites of Tureng Tepe, Shah Tepe, and Yarim Tepe. Sparsely vegetated today, the Gurgan was in ancient times a belt of fertility and prosperity, densely inhabited until the Turkoman incursions of the nineteenth century (Whyte 1961: 79). The sites of the 'Gurgan culture' yielded grey pottery, as did Tepe Hissar, but in different shapes (Deshayes 1967).

The famous (6-ha) site of Tepe Hissar, near Damghan (Schmidt 1937), lay south-west of the Shahrud pass, on a route connecting Turkmenia with the Iranian plateau. It is often a reference site. It had a substantial lapis lazuli cutting industry during its late history, judging from the finds of stone tools for cutting the stone and drilling beads, and pieces of lapis. There was also a well-developed metallurgical industry with a varied range of copper/bronze artefacts, gold, silver and lead vessels, and ornaments in silver, lead, and gold as well as lapis lazuli and amber. It appears that as metal smelting and consumption increased (over 300 kg of slag lies on the surface of the mound), the inhabitants developed the reduction kiln for pottery as a strategy to control the consumption of charcoal fuel (Pigott et al. 1982:216 ff.).

An efflorescence in metal techniques and production marks the last (III C) occupation of Tepe Hissar after 2100 BC (Voigt and Dyson 1992:171-4). Paradoxically, however, the occupied area shrank; also, this level was preceded by destruction of level III A of the town. Schmidt (1937:235-7) concludes that Hissar was 'destroyed by fire and sword'. The re-occupied Hissar III C, like contemporary Tureng Tepe and Shah Tepe, yielded less the architectural remnants of houses than hoards and fifty-three exceptionally rich graves, on 'Treasure Hill', as well as interred caches. This is surely a pointer to upheaval in a region and period prosperous in metals and metallurgical technology.

THE ARYANS

Scholars inevitably link any discussion of the termination of Bronze Age occupation of north-eastern Iran to the migration of speakers of Indo-Iranian languages. That such a migration occurred has been asserted by historical linguists. Historical linguistics is a discipline which investigates the histories of languages and their relationships and movements, and reconstructs the 'proto' or original forms from which similar words of related languages could have been derived. It is also a science of language usage and change, and their social context in contemporary life. This discipline, in fact, emerged in the nineteenth century around the common past and interrelated features of a

very large group of languages, known as 'Indo-European': Greek, Sanskrit, Latin, German, Persian, and many others.

These languages are so similar in structure and vocabulary, historical linguists say, that they are all derived from a common parent language, a language they dub 'Proto-Indo-European (PIE)'. On the basis of common words, reconstruction of the cultural context of PIE, and Indo-European relationships with other language groups, the ancestral homeland of this parent language is said to have been the vast grasslands or steppes of southern Europe and Central Asia.

Two factors, in particular, are involved in the identification of this homeland. First, there is ample evidence for give and take between Indo-European languages on the one hand and Finno-Ugric or Uralic languages (Hungarian, Finnish, Volgaic, Estonian, etc.) on the other. This means that in their very early history these two language families shared an extensive common border, which provided opportunities for repeated interactions. The Finno-Ugric homeland comprised the fertile forest belt of Europe which lies north of the drier steppe land. The Finno-Ugric ancestors must have derived their knowledge of agriculture from the Indo-Europeans, as several words like those for grain, grass, and goat are derived from Indo-European. There are grammatical affinities as well (Mallory 1989: 147-9).

Second, there is evidence that the ancestral homeland culture involved agriculture and animal herding, and simple metallurgy, with great importance being given to the horse. The horse was 'embedded in the culture of the early Indo-Europeans' (Mallory 1989:119), and all the related languages used a term derived from PIE *ekwos, for 'horse'. The horse is important in the *Rgveda*, with two entire hymns devoted to its praise; it is associated with the Iranian deity Mithra; horse sacrifice was important in ancient India and Rome. This animal, *Equus caballus*, it is certain, was a native of the Eurasian steppes and nowhere else: the wild ancestor from which it was domesticated belongs to these steppes.

For our purposes the relevant question is that of the Indo-Iranian languages (Avestan- Old Persian, Vedic Sanskrit, and the language of a few texts from the Mitannian kingdom of northern Syria). They did not each derive singly from the ancestral Indo-

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European. Instead they are all derived from one branch, an undivided parent, which linguists call Indo-Iranian. This branch had split off from Indo-European somewhere in the eastern part of the homeland (probably the north-east Iran-Turkmenia-Bactria steppes), and this split was a separate process from the branching off of Hittite, a language very close to PIE that gained currency in Anatolia between 1600 and 1200 BC. (Between the Vedic, Avestan, and Mitannian languages of the Indo-Iranian branch there is little chronological distance.) The horse is evidenced at Tepe Hissar, in Turkmenia in the Namazga VI period, in Bactria and Margiana, and in the Kacchi, generally after 2000 or 1800 BC.

The migration of people is the mechanism by which languages move from one place to another, but archaeological evidence for migrations is rarely self-evident. Moreover, there will always be serious doubt whether language groupings can be inferred from archaeological patterns. Rarely do we find a clear chronological sequence of related archaeological assemblages over the map; the evidence itself usually comprises a few characteristic items but a large number of humdrum artefacts remain unobserved and out of purview. Not all the identified characteristic items occur at all the sites marking a reconstructed 'route' and similarities in artefacts can themselves be questioned (Ratnagar 1999). Second, in the case I will discuss, evidence for material culture similarities is exceptionally strong over a large region west of the Harappan zone and touching its western and northern frontiers, but these do not necessarily give us the movements/migrations of specific speech communities. Linguistic groupings are not necessarily co-extensive with material culture groupings. In fact, an archaeological 'culture' cannot be assumed to represent one people, or 'a tribe'. It has often been found that an area with two broad material culture divisions is actually inhabited by 30 recognized-as-separate tribes (ibid. for details). Nor does every archaeologically-attested movement out of Central Asia necessarily have to be a migration of Indo-Iranian speaking groups. In the thirteenth and fourteenth centuries of our era, for example, it was Turko-Mongolic groups that advanced from the north into eastern and south-eastern Iran.

Third, and this is extremely important, the movement of a

language into a new homeland certainly requires that its speakers move, but this is not tantamount to mass movements of hordes of tribes, much less a sequence of destruction and trails of settlement desertions along the way. Aramaic did not become the lingua franca of western Asia due to mass migrations. Even in the case of the Sea Peoples of 1200 BC (mentioned above), it has been stressed that they were groups of marauders and adventurers but not an army. There was no 'movement of population' as such (Tritsch 1973). In fact, decades ago Father Heras (1953:12-17) had asserted that Indo-Aryans came into South Asia in small numbers and intermarried with the natives, and that consequently Dravidian speakers became bilingual. Thus, even though Indo-Aryan languages did not originate in South Asia, we cannot suggest that 'the Aryans' are 'a cause of the end of the IVC'.

What matters for us, instead, is that the Gurgan valley, as the excavator of Tureng Tepe said in 1932 (quoted by Cleuziou 1986), lies at the junction of the Iranian Plateau, the oases of Turkenia, and the Eurasian steppe land across the Caspian. Tureng Tepe, Yarim Tepe and Hissar occupied a frontier between agriculture and mobile animal rearing, a frontier which, of course, has shifted back and forth through history. Thus, earlier explanations for the desertions of these sites in terms of climatic change and epidemics and cultural decline were soon given up for the 'invasion by nomads' theory, especially with Deshayes' discovery of the burned ruins of a monumental structure at Tureng Tepe III C and the subsequent abandonment of that site until about 800 BC. Yet, we should bear in mind the observation of Arne, the excavator of Shah Tepe, that the invaders could as well have been Turks as Indo-Europeans!

It is often asked why and how Indo-European languages could have spilled out in so many directions from a single homeland. Mallory (1989: 147) points out that a similar 'spill' was to occur later also. Speakers of Turkic languages, from a sixth-century homeland somewhat east of the PIE zone, 'virtually exploded over an area in excess of 2,500,000 square kilometres by the ninth century AD'.

It has been suggested, in addition (Ratnagar 1999), that it was the nature of pastoralism, as it had developed on the steppe by

2000 BC, which gave rise to repeated outmigrations. The herding of several animals, cattle, sheep, goat, and also horses was done from horse back. Once the horse could be controlled by a rider the mounted herder could cover long distances in a day, and scout for good pastures and stray animals; this would ensure that flocks moved fast when necessary. This, in turn, would make the tending of large herds possible and large herds would necessitate more labour and hence a schism between herding and agriculture. In a positive feedback mechanism would arise yet more geographically extensive pastoral circuits and larger flocks. This, coupled with certain geographic factors—such as rainfall variability, scarcity of ground water, and the choking of surface run-off channels by large herds if carelessly moved—would mean a precarious balance between people, animals, and the land, necessitating periodic outmigration.

We would, thus, agree with Cleuziou (1986:246-8) when he argues that the desertions of the Gurgan valley sites reflect less an Indo-Iranian event than the historical pattern of a frontier region: '. . . gaps in the archaeological record are due to the fluctuations between settled agriculture and steppe pastoralism', he says. I would add that such fluctuations could have been caused by the spilling out of horse-mounted pastoralists from their homeland, as much as by political events or economic factors.

INTERREGIONAL CONNEXIONS AND DEPOPULATIONS IN THE WESTERN FLANKS

A great deal of cultural complementarity is evident between this north-eastern corner of Iran and southern Turkmenia, with its long history of development from the neolithic to the Bronze Age, peaking in the Namazga V period. Already in the Namazga IV stage, besides local pottery a grey ware of Gurgan affinity was utilized at two sites (Kohl 1984a:105-8), at one of them in graves. This ware then disappears in the Namazga V period, which is epitomized by the 26-ha, ritual-cum-urban centre of Altyn-depe with its fortifications, parade entrance, craftsmen's quarters, elite residential quarter, and priestly sepulchre by a temple-like monument.

Rich funerary offerings were found in the sepulchre and intramural graves in the elite quarter: gold animal heads, lapis lazuli, turquoise and carnelian jewellery, ivory and shell items. There were also ritual items like marble miniature columns and large handled discs of marble or alabaster (Pl. 17), with striking parallels at Hissar III C. Two seals of Harappan affinity, and also etched carnelian beads and segmented faience beads come from that period of Altyn. For Kohl (1984a:132) it is significant that 'the majority of the best parallels to Harappan materials seem to come from the very latest levels'.

Many settlements of the Namazga V period were abandoned around 2200 BC—this was, in any case, according to Kohl, a period of short duration. Small villages near Namazga were depopulated once the town was abandoned; it shrank from 50 to 2 ha (ibid.: 140), just as Altyn-depe too became, in the Namazga VI period, a fraction of its former size (Masson 1992:243). At Namazga-depe a metre-thick sterile layer separates level V from level VI. The total settled area fell from 105 to 35 ha (Kohl 1984a:117, 135). The reasons may be complex; the villages had had their own metallurgy and crafts, and could not have been totally dependent on Namazga (ibid.:120-1).[1]

Almost simultaneously, new settlements appeared in the endoric drainage basin of the Murghab river (Margiana) east to south-east of Altyn-depe, in a landscape characterized by the silt deposits of the muddy Murghab. In this environment the migrants learned to sow the same crops and breed the,same animals as they had in Turkmenia.

The reasons that have been suggested for the depopulation of the Turkmenian piedmont are environmental degradation, over-urbanization, shifts in world routes, and incursions from the steppes. What matters is that there was an eastward movement into Margiana; the earliest occupied sites there, like Kelleli, have a material culture of Namazga VI vintage where metallurgy, ornamental pins, mirrors, and seals are concerned. Thus, together with depopulation there was colonization as well as technological continuity (Masson 1992; also P'iankova 1994:361). Settlement in Margiana gradually increased and six arms of the Murghab delta saw ribbons of occupation, with Gonur-depe (50 ha)

becoming the largest settlement. In the subsequent phases of occupation, moreover, an influx of 'steppe elements' is evident. Kohl (1984a:144) has argued that the entire settlement of Margiana could not be explained by migration from the piedmont alone because: (*a*) bones of the horse at Namazga VI sites in the piedmont (Namazga, Tekkem depe) and in Margiana (Kelleli 1 and Taip depe), (*b*) characteristic burial types (Kuzmina 1997), and (*c*) heavily tempered 'steppe' ceramics, baked in open bonfires, with incised zigzag decorations that were native to regions further north, occurred in buildings in Gonur and at camp sites in the region (P'iankova 1994:365, Moore et al. 1994:426). Parpola (1997:303) states that the Bactria-Margiana-Archaeological Complex (BMAC) is the southernmost extension of the Andronovo (steppe) pottery and this indicates the migration of groups of Indo-Europeans from the steppe. (Actually, Kuzmina (1997) has detected Namazga VI pottery elements in Andronovo assemblages in Kazakhstan also.)

The BMAC (2200-1700 BC) is irrevocably incorporated into the Indo-Iranian rubric, to the extent that claims have been made for the identification of ephedra residues in pottery with *soma*, and the forts of Margiana are said to be the forts of the Dasyus of the *Rgveda* even though metallurgy, complex seal designs, and other aspects including natural history find no mention in the *Rgveda*. What is more important, however, is that the fortified centres of Margiana and Bactria are small, say 4 hectares, in contrast to Altyn-depe and Namazga-depe; the morphology of the settlement at Sapalli-depe in Bactria points not to an urban, stratified society, but several kin units with their own pottery production facilities. Moreover, even when riches have been found in graves the quantities of grave offerings tend to depend on age—which rules out inherited or ascribed social positions (see Kohl 1987; Lamberg-Karlovsky 1993 and 1994).

Just as the early settlement of Margiana dovetails into the Namazga VI occupation of Turkmenia, so also in a later period people from Margiana moved eastward to the right and left banks of the Oxus, to settlements like Sapalli-depe on the Surkhandarya, which has late Murghab affinities. This is not our concern, except in that the Iron Age culture of the steppe, with its timber tombs

under mounds and its horse chariots, would also influence Bactria (Kohl 1984a:199-200).

Of more immediate relevance to the end of the Indus civilization is the dispersal of distinctive artefact types over this entire region as well as into the Harappan region. More than 250 excavated graves at Shahdad, on the western edge of the Dasht-i Lut, have produced pottery, miniature stone columns, seals, copper/bronze axes, and mirrors 'identical' to those of Bactria and Margiana (Lamberg-Karlovsky 1993:36-8)—to the extent that seals from Bactria and Shahdad could have been cast in same mould (Kohl 1987:21).[2] Graves of later periods have thrown up pottery similar to that of Tepe Yahya IV A and can therefore be dated to 2100 to 1900 BC (Curtis 1988:119-20). Population movement from Bactria-Margiana southward, during or soon after the Namazga VI period, is one explanation for this 'identity'. In medieval times Turks and Mongols pushed the Baluch population toward Afghanistan and Baluchistan and many of the latter turned sedentary along the lower Helmand (Balland and de Benoist 1982). Toynbee (1961:58) refers to a series of 'mountain-ringed pastures' and 'green amphitheatres' that mark the north-south route between the Oxus and Seistan which he found 'full of grazing camels, sheep and goats. He inferred that any invading nomads from Central Asia would find 'almost continuous inviting pasture' right down our western flanks.

At Mundigak (Casal 1961) near Kandahar, whence one can reach the Indus plains by taking the route to Quetta and along the Bolan Pass, the palace and defences of period IV.1 saw a total destruction. There is ash and wall collapse, and, near the palace wall, an abundance of sling stones and arrow heads. Casal was convinced that the town had been attacked. Thus Mundigak appears to have suffered a fate like that of Shahr-i Sokhta, whose burnt building was mentioned above, but the town was re-occupied (Mundigak IV, 2) though the palace remained deserted.

THE RELEVANCE TO SOUTH ASIA

The bronze cosmetic flagon (Pl. 18) known at Hissar, Altyn-depe and in Bactria, also occurs at Chanhu-daro as a beautifully fluted

piece (Mackay 1943: Pl. LXXIII.39), in a probable Jhukar context. Round bronze mirrors (Fig. 16) with tangs for fitting into wooden handles, as at Hissar, Altyn-depe, Gonur 1, Sapalli, Dashly, Shahdad and Khinaman, and Mehi—some of them with a handle shaped as a human body—also occur at Harappa (Vats 1940: Pl. CXXIV.29) and Mohenjo-daro (Mackay 1938:477-8). Twelve such mirrors occurred in graves at Harappa (Wheeler 1947-8:85 ff.) and one in a Kalibangan grave (Rissman 1988:211-14). Rissman has remarked that in Harappan graves it was mirrors rather than any other bronze item that tended to be deposited (ibid.:214), and that only one such mirror occurs in a Harappan hoarded treasure (ibid.:217).

The beautifully cast, socketed adze-axe (Pl. 19) of Gonur 1 has counterparts at Hissar, Shahdad, Khinaman and also Mohenjo-daro (Mackay 1938:457-8). (The latter is a superbly cast piece, more than 25.5 cm long, whereas a clumsy clay model of a socketed axe, from elsewhere at the site, is less than half its size. The existence of the clay model cannot by itself show that such

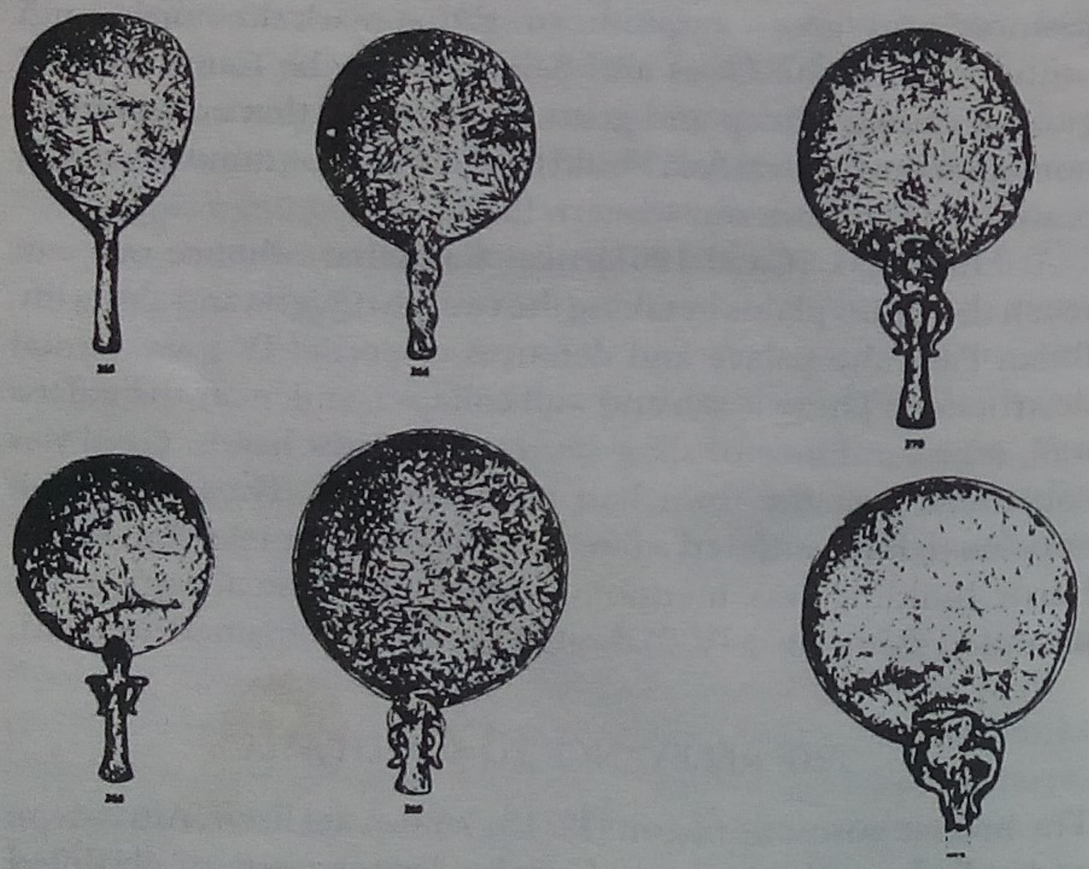

Figure 16. Bronze mirrors from Bactria.

axe-adzes were made at Mohenjo-daro. For that, skill in making moulds and in casting was necessary). Harappa and Chanhu-daro each have a single bladed socketed axe (Vats 1940:Pl.CXXII.18; Mackay 193: Pl. LXXII. 25). Exquisite bronze animal-headed pins (Pl. 20) or 'wands' at Dashly and Hissar (Schmidt 1937:194-7) have a counterpart in the latest stratum of Harappa (Vats 1940: Pl. CXXV. 36, p. 390) (Pl. 20) in an 'antimony stopper rod' surmounted by the figure of a dog biting the ear of a goat; and at Mohenjo-daro where a rod is surmounted by an antelope (Piggott 1947-8). There are also compartmented seals whose faces bear raised geometric designs, from Mohenjo-daro, and the white steatite stepped seal with a stylized eagle from Harappa has Bactrian connexions (During Caspers 1997) (Fig. 17).

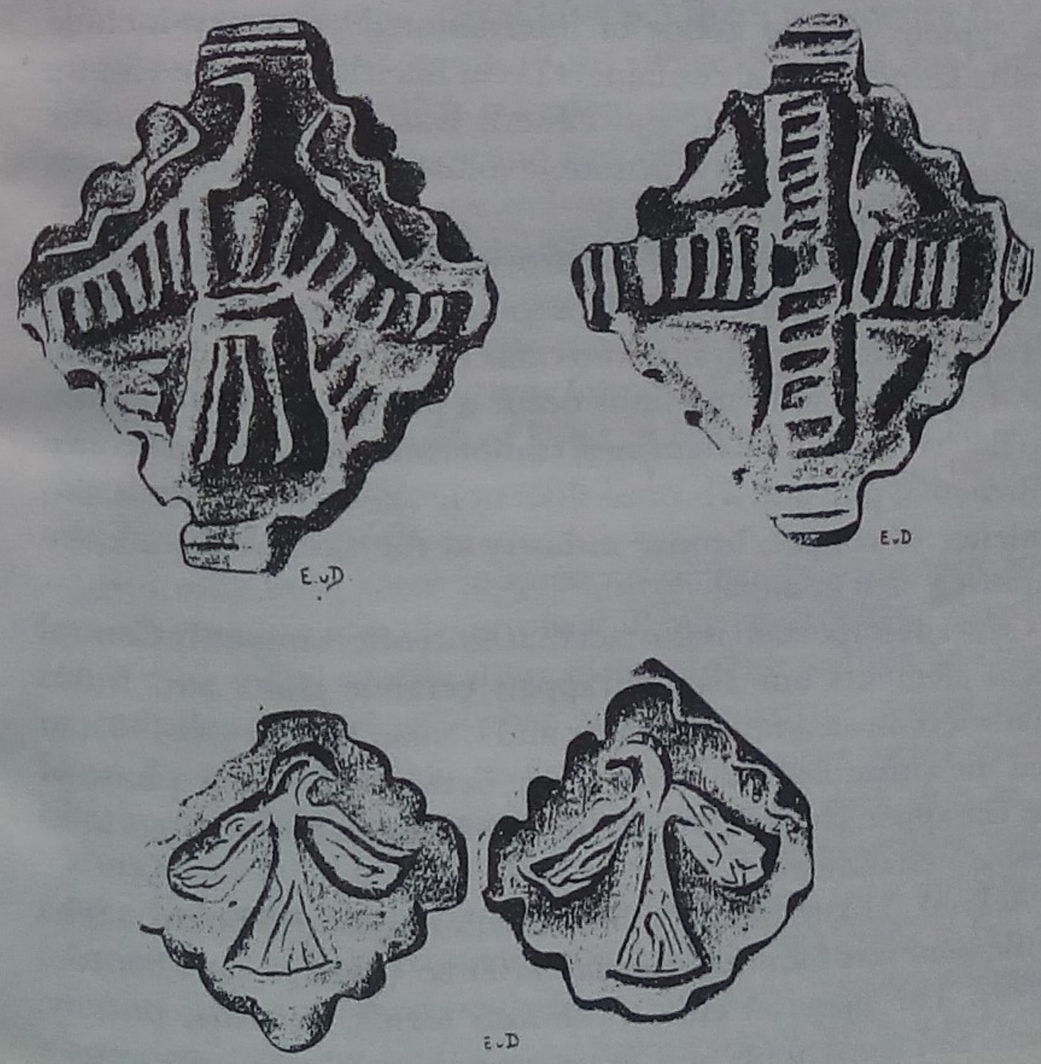

Figure 17. Seals of stepped shape depicting eagles. Harappa (*above*) and Bactria (*below*).

The purpose here is not to elaborate on a list of similarities between the regions, for such an exercise often tends to neglect context and co-occurrence, and simplistic conclusions are drawn about 'trade' or 'migrations'. The point is, instead, to highlight the relevance of the happenings in this region to the Harappan centres, and suggest that there may be some interconnexion between the series of Harappan settlement desertions and colonizations, and events in the western region.

The Kacchi plain, on the frontier between the Indus valley and Baluchistan, was also affected by group movements. Western contacts re-appear at Nausharo after the Harappan period.. The famous neolithic site of Mehrgarh near Dadhar has a South Cemetery with ordinary graves, 'cenotaphs' devoid of human remains but with offerings, and grave goods interred in pits. At this cemetery grave goods of international currency include steatite kidney-shaped containers (as in Bactria), a stone sceptre as in sites of the BMAC and eastern Iran, a bronze cosmetic flagon, mirror, and pins with double volutes or bird-shaped heads (Santoni 1984:52-4).

Also in the Kacchi, near Nausharo, was a small (1-ha) and short-lived settlement, Sibri (ibid.). This could have been the settlement of a small group of migrants who came down the Bolan Pass from Central Asia: among the finds occur a polished stone column, two flat, violin-shaped figurines, compartmented seals, a bronze ornamental pin, and a bronze shaft-hole axe-adze. There is also evidence of copper/bronze industry at the site, which is comparatively rich in metal.

Critically important is the fact that Sibri offers not only Central Asian elements but also Harappan ceramic traits and Indus characters on an amulet (Jarrige and Usman Khan 1989:150), so that the chronological coincidence between the later phase of the Harappan civilization and the momentous happenings to its west are established.

At Pirak, 11 km south of Sibi on a tributary of the Bolan, a 9-ha settlement was founded around 1700 BC (Jarrige and Santoni 1979). The material culture—house forms, hearths, pottery, bone and stone tools and grain storage methods—presents a contrast to the Harappan material culture. Moreover, at Pirak the

horse and the two-humped Bactrian camel (probably domesticated, centuries earlier, in Turkmenia) are represented by their bones. Among artefacts there are Murghab type stone seals.

Where movements of groups from eastern Iran-Central Asia are concerned, northernmost Pakistan also becomes relevant. From about 1700 BC, cemeteries and villages in Swat (period IV) had a material culture which seems to have been a curious amalgam of elements from South Asia (painted pottery), north-east Iran (grey burnished pottery, violin-shaped figurines, the horse) and China (jade pendants, stone harvesters, and ornate bone pins; Tusa 1979, Stacul 1970, 1979, 1984). In time Swat, too, would receive steppe elements from Tadjikistan, via north Bactria, according to Kuzmina (1976). As regards connexions with China, it needs to be said that these are visible in Bactria too: in four graves at Sapalli-tepe (2000-1700 BC) there is evidence that the dead were wrapped in silk (Kohl 1984a:155). Was this Chinese silk (see Good 1995)? It is evident that connexions with north-eastern Iran-Turkmenia and the BMAC are manifest both at major Harappan centres and on the fringes of the Harappan heartland. While during the Mature Harappan period contacts between the plains of the Indus and the hills of Baluchistan were meagre and there were few inhabited villages in the western mountains, pottery of the type found at Pirak and Nausharo now occurs at Ispelanji north of Kalat, at Dabarkot in Loralai and at Sulaimanzai on the Quetta plateau (Jarrige and Santoni 1979:389-90; Jarrige 1985:43-5).

Not only were there movements of groups of people, social transformation was also involved. While centres like Altyn-depe with their social stratification, elaborate cult centres, and varied metal alloys were clearly urban, the settlement forms in Margiana and Bactria, according to the early excavators (see Lamberg-Karlovsky 1994), are totally different, with each arm of the Murghab settled by an individual tribe or tribal section, and, as stated already, separate families occupying each settlement. According to Hiebert and Lamberg-Karlovsky (1992), in fact, the BMAC was a short-lived (say two-century) phenomenon, collapsing between 1900 and 1700 BC, and followed by migration to eastern Iran and the Kacchi.

METAL

We had referred earlier to the economic importance of copper and bronze in the Harappan world. The most important aspect of the upheavals in the Iranian-Turkmenian-Bactrian world was the connexion with metallurgy. Of this entire region, Turkmenia, Margiana and Bactria lack metal ores even though they saw flourishing metallurgical crafts (Kohl 1984a:71; Hiebert 1994:384). In constrast, the ceremonial centre of Sarazm on the Zeravshan (Uzbekistan) was located in a zone rich in copper, and in the third millennium has abundant bronze artefacts as well as slag, crucibles, and other residues of metallurgy (Isakov 1993:32). At Shahdad, an important site east of Kerman in south-east Iran, with rich burials, there is much evidence (clay moulds, casting furnaces, ore, slag, and stones for crushing ores) of copper smelting and casting from ores in the vicinity of the site (Ali Hakemi 1992). Sources of copper for Tepe Hissar were probably mines to the east, on the route to Nishapur, and also to the south-west at Anarak, where native copper contains up to 15 per cent arsenic, and arsenic itself could also be mined (Stech and Pigott 1986; Berthoud et al. 1982). For the Harappans, Rajasthan, Baluchistan, and Oman, perhaps outcrops in the Shivaliks too, were copper-source areas.

Furthermore, given its hardness (2.5 to 3) and melting temperature, copper is not important by itself; for requisite hardness and ease of melting for casting, it needs to be alloyed either with tin (hardness 6 to 7) or with arsenic (hardness 3.5) in the correct proportions. Alloying with tin is especially beneficial for casting, as even an 8 per cent tin alloy reduces the melting temperature of the metal from 1085 degrees C to 1020 degrees.

From the literature on metallurgy it appears not impossible that arsenic alloying gradually gave way to tin alloys in western Asia towards the middle of the third millennium (Stech and Pigott 1986; Cernyh et al. 1991; Tylecote 1992; Pigott, Howard and Epstein 1982; Eaton and McKerrell 1976; Moorey 1993; Berthoud et al. 1982). One reason may have been that arsenic is valuable—making the metal appreciably harder—only when objects are cold hammered and not when cast. While heat softens

an arsenic alloy, cold-hammering hardens it. More than 8 per cent arsenic cannot be easily alloyed with copper (Northover 1989:113). Another drawback of arsenic would be the toxicity of its fumes. Tin bronze is easier to cast, and gives tools with harder working edges.[3] Comparing tin- and arsenic-alloys, Northover (1989) finds that the two are not comparable in strength and hardness: no matter what the alloy content, tin bronze is the harder metal (see Fig. 13.4, ibid.). '. . . even a 3-4 per cent tin bronze . . . offered a significant advantage over a majority of contemporary arsenical coppers' (ibid.:114).

That tin bronze replaced arsenic alloys during the third millennium is only a rough and ready generalization—for example some of the earliest Mesopotamian texts, soon after 3000 BC, refer to tin-bronze (Berthoud et al. 1982)—but it is clear that patterns of usage varied according to region. Nevertheless, it appears that until its desertion Tepe Hissar manifests the utilization of arsenic bronze and a little lead alloying, with very little use of tin as an alloy (Pigott et al. 1982:230). In Turkmenia, from the Namazga IV period onwards, copper-arsenic, copper-lead-arsenic, copper-lead, and copper-lead-tin alloys were in use, with some tin in the Namazga V period (Kohl 1984a:113-27). According to Sarianidi (1993:6-7), arsenic-bronze predominated in Margiana, lead-bronze in Bactria. So also, at the major metallurgical centre of Shahdad, and Khinaman to its west, arsenic bronze was the rule (Curtis 1988). The Turkmenian method of alloying three metals (occasionally manifest also at Susa after 2000 BC) is pronounced to be (Berthoud et al. 1982:47) a means of making good with the metal on hand.

At Harappan sites a certain proportion of the bronze was a tin alloy, with some lead and arsenic bronze. Tin bronze was also in use at Shahri-i Sokhta and Mundigak, as it was in the Royal Cemetery at Ur around 2600 BC and earlier at Tepe Gawra VIII in northern Mesopotamia (Stech and Pigott 1986:43), in Egypt especially during Dynasty IV times (2600 BC), and at Susa. But it was in the late third millennuim BC (Stech and Pigott 1986; Berthoud et al. 1982: 43 ff.), that the use of tin bronze became frequent in Mesopotamia.

Tin, a rare metal, must have been actively sought. As far as

present evidence goes, it is available in quartz veins in granite rocks in the desert east of the Nile; in south-central Anatolia; and in the Caucasus near the Black Sea coast. The Taurus mountains of southern Anatolia are likely to have provided cassiterite during the third millennium, but not thereafter (Earl and Ozbal 1996). Close to the Sarazm site in the Zeravshan valley, where there exists indirect evidence of contacts with Mesopotamia-Elam (a cylinder seal) and South Asia (two sea shell ornaments), copper and arsenic are also found (Isakov 1993:32-3). More directly relevant for us, tin is also to be found in eastern Afghanistan from Badakhshan southward to Kandahar; and in western Afghanistan from Herat south to Seistan, occasionally with copper, in substantial spreads over, say, two and a half kilometres (Stech and Pigott 1986).

Less well known but probably very important is the area even further south, along the arid international frontier between Iran, Pakistan, and Afghanistan, and covering south Seistan and a part of Baluchistan. On the Afghan side, south of the course of the Helmand and in the arid Gardan Reg or desert Dales (1992:23) in his 1968-71 survey found miles of terrain 'literally paved' with slag containing a high percentage of copper. In fact, from Seistan southward to this frontier zone there are several deposits of fine marble or calcite and alabaster; these also occur in gravel fans in the Malik-i Siah Koh (Ciarla 1981:46,47). On the Pakistan side, eastward in Chagai, fine grade marble and onyx are also found (Ahmad 1964:105). The Malik-i Siah Koh at the junction of the three frontiers is a reported source of copper ores, and so too Saindak in the Pakistani portion of the 'triangle', on the eastern slope of the Kachakoh, with numerous small veins of malachite, cuprite, and chalcopyrite (Khan et al. 1964). Further south, on the northern face of the Sarhad plateau, 'in an uninhabited valley', Skrine (1931:336) learnt of abandoned copper mines. As for the district of Chagai further east, here the arid and inhospitable hills have not only marble but also copper ores and turquoise, antimony, and lapis lazuli.[4]

This southern region is of critical importance to our understanding of the settlement desertions and migrations that occurred at the end of the millennium. Polished alabaster columns, discs,

and handled weights of the sort found in ritual deposits and graves at many sites in the western flanks—Hissar III C, the burnt building with the high terrace of Tureng Tepe III, Turkmenia in the Namazga V Period (the Altyn-depe priestly sepulchre), Sarazm where they weigh between 12 and 19 kg (Isakov 1993:33), Togolok 21 in Margiana (in a central, large, structure) and Tillya Tepe in Bactria, and in Shahi Tump together with a shaft-hole axe—occur at Muslim shrines[5] here, from Godar-i Shah to Chagai (Dales and Flam 1969; Dales 1977; Hiebert 1994:381) (Fig. 18). Most significantly, these are known to occur also in a cenotaph at Mehrgarh South Cemetery and in the Quetta Hoard, and among the finds at Sibri are a vented furnace said to be like those in the Gardan Reg, as well as Gardan Reg-like pottery, incised, ribbed, and string-scored (Santoni 1984:56, 58).

This is a curious coincidence of obviously ritual objects,[6] albeit out of their protohistoric context, and a copper-producing protohistoric area, called a zone of 'international metallurgy' (Santoni 1984:58). One is reminded of the axiom that sacred cults tend to intensify during times of political trouble or economic crisis or collapse of population nodes (see, for example, Burger 1992:180-93). Regional cults can spread over hundreds of miles, attracting people of diverse cultures, and creating channels for crossing of cultural boundaries (ibid.).

THE ELAM FACTOR

Jarrige (1997:15-20) sees a connexion between the decline of the Mesopotamian trade through the Gulf, and the rapid development of the BMAC. What precisely this connexion could have been, however, is hard to spell out. Settled life in the metallurgically important Zeravshan valley came to an end soon after 2000 BC. Was Central Asia integrated into the trade network feeding Mesopotamia? Another possibility is that developments in Elam brought about a change in the patterns of the movement of metals.

Elam was a polity that often integrated the plains east of the Euphrates-Tigris lowlands with the mountains and plateaux of Iran. Susa, its earliest political centre, is remarkable for its early

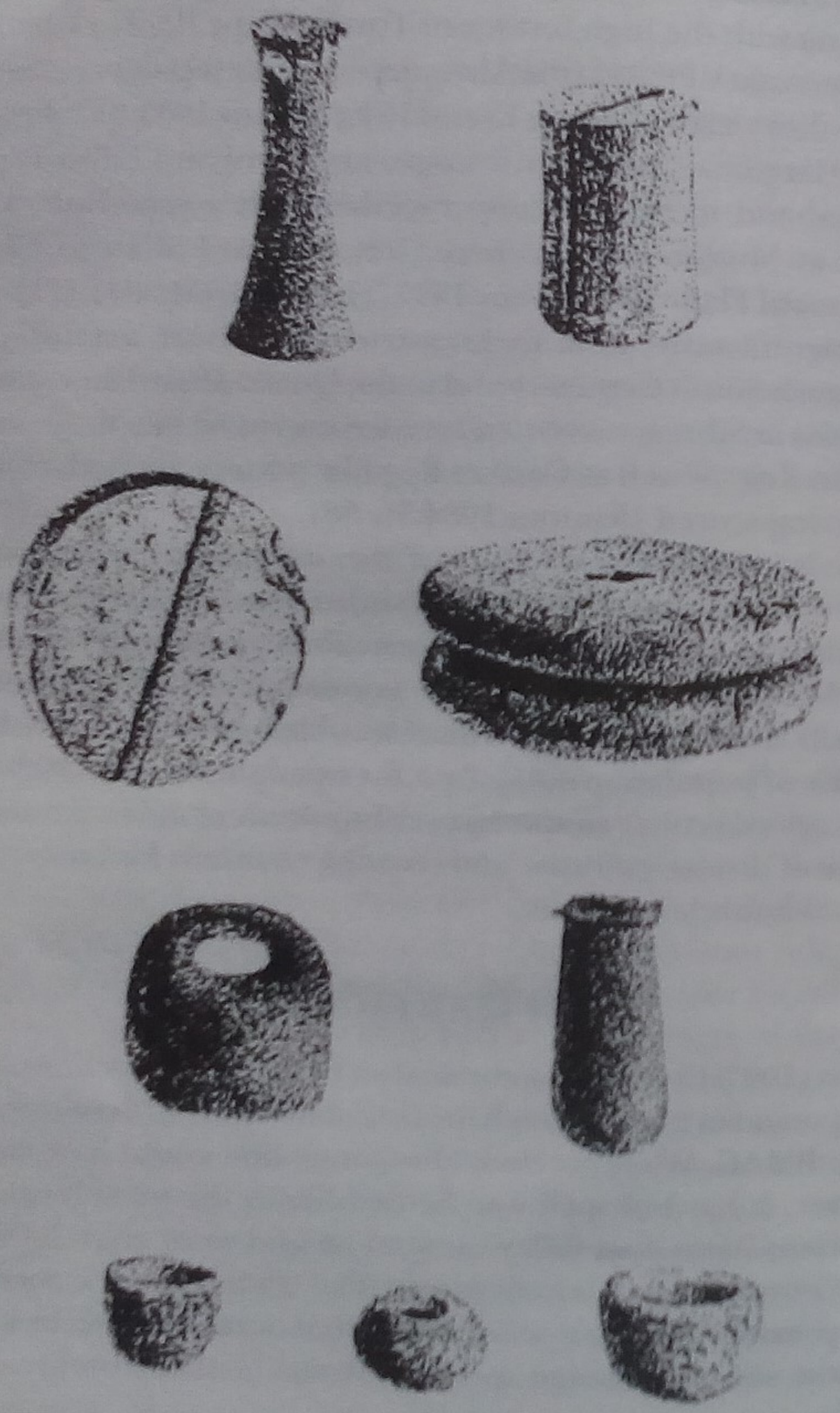

Figure 18: Stone objects deposited at Godar-i Shah.

use of metal on a comparatively large scale (Berthoud et al. 1982:40). Between, say, 3300 and 2800 BC Susa appears to have had trade 'colonies' on the central Iranian plateau at Sialk, in the southern Zagros at Giyan, and even in south-eastern Iran at Tepe Yahya (Amiet 1986:262). Thereafter, Susa lost its autonomy to Mesopotamia. Its rulers became vassals of Mesopotamian kings and the language and writing system of Mesopotamia now came into use locally. Sialk and Yahya saw abandonments. For Susa this was to be a period of ethnic and linguistic 'duality' (Amiet 1979). By the middle of the third millennium Mesopotamia was receiving supplies of metal from Meluhha, Magan, and Dilmun along the maritime route. The trading city of Qala'at al Bahrain had been established by 2400 BC, and in place of arsenic bronze Mesopotamia began to utilize tin bronze. The lowlands and highlands of south-western Iran (Elam) suffered the political and military domination of Ur and its regional dynasts entered into matrimonial alliances with the royal family of Ur. Perhaps some of the sea trade reached Elam in this period.

A major change occurred around 2000 BC when Elam revolted against the dominance of Ur and invaded that kingdom. An Elamite garrison was posted at Ur (Carter and Stolper 1984:19) and the period finds mention in some Sumerian lamentation poetry. It is from then on that tin-bronze began to be used in fair proportion (about half the analysed objects, as against only about 10 per cent in earlier periods) at Susa.[7] The kingdom of Elam became not only independent, it brought under one rule much of the mountain region of southern Iran. The settled area in the Susa plain increased twofold, and Susa itself grew to be an 85-ha town (Carter and Stolper 1984:150). Obviously, once politically dominant, Elam was able to divert tin or tin-bronze supplies to itself. Significantly, there are cuneiform texts of the period after 1800 BC which record the movement of tin from Elam to central Mesopotamia and the kingdom of Mari on the Euphrates (see, for example, Malamat 1989:57-8). According to Amiet, Elam now began to look towards eastern Iran and Bactria (there are marked cultural synchronisms with Shahdad). This change in the position of Elam could have had some causal connexion with the copper quests and movements and spread of cults to the west of the

Harappan world. In Harappan metallurgy, we had said, arsenic alloying was not frequent, and some amount of tin-bronze was in use at the start. While we accept that contemporary communities in Rajasthan and Malwa (represented by the Ganeswar and Kayatha cultures, for example) did utilize copper on an appreciable scale, and could well have supplied that metal to the Harappans, they did not utilize tin alloys (Dikshit and Sinha 1979-80:120; Agrawal et al. 1981).

Shortughai, which was a Harappan colony in the true sense (because Harappan elements plus lapis flaking are attested here since its foundation; Francfort 1984:303, 1989:253), ceased to have a lapis industry in period II, when Bactrian elements appear in the pottery (Francfort 1989:255-60). Period II represents the end of the Harappan tradition here. In periods III and IV that follow, the material culture is very different, Bactrian in its ceramics, with few active links with the Indus region (ibid.: 174), and new subsistence strategies and storage methods (ibid.: 266). Is this a kind of literal testimony to the end of one interregional system and the beginning of another?

I had earlier referred to the trail of destruction caused by the migration of the Sea Peoples, which brought the Bronze Age of much of western Asia and the eastern Mediterranean, including the Mycenaean kingdom, the mighty Hittite empire, the sea trading kingdom of Ugarit, and the settlement in Cyprus, almost literally to their end. Consider the bronze idol (Plate 21) which comes from a sanctuary dated to the twefth century BC, in Cyprus. It is known as the 'ingot god', as the figure stands on a typical 'ox-hide'-shaped ingot, characteristic of the eastern Mediterranean in the later Bronze Age. This god of metal workers is clearly also a warrior, armed with a long sword and a round shield, and wears a horned helmet. These features and the dress identify him as a Sherden, depicted elsewhere in the art of the period. The Sherden, once mercenaries, were one of the Sea Peoples, and appear as fearsome raiders in contemporary records. Here, at the tail end of the western Asiatic Bronze Age, we find again a coincidence between metallurgy and ritual (a statue dedicated in a shrine), and also a strong association with warfare and destructive migrants (the man is armed, a warrior).

NOTES

1. An appreciable distance to the north-east, across the Oxus and in the Zeravshan valley upstream of Samarkand (Isakov 1993), the urban centre of Sarazm also saw an end of settled occupation around 1750 BC; the valley, it is said, was then gradually peopled by tribes of a different civilization who were animal herders.
2. West of Kerman and Shahdad lay another cemetery, Khinaman, its contents plundered early in this century. It dates to the same period as later Shahdad, and has very similar bronzes (Curtis 1988).
3. Lechtman (1996) cautions that hardness is not the only relevant factor. There is tensile strength and ductility as well, and in this arsenic bronze is not demonstrably inferior to tin bronze. Regarding cold-worked metal Northover (1989:113) says that arsenic alloys retain a 'significantly greater ductility'.
4. Trade in the latter is associated with the metals trade in an intriguing way. First, at Shortughai, one piece of lapis is part of a rolled pebble from a stream bed (Stech and Pigott 1986: 46)—which indicates that not only alluvial gold and tin but also this blue stone could have been panned in the lower Kokcha and the lapis quarries further upstream did not have to the reached. Unfortunately, few analyses of the sparse metal objects from Shortughai were made—these indicate that in the Harappan period copper, arsenic-bronze and bronze with a low proportion of tin were in use (Francfort 1989:207-9). Also important for '2000 BC' is the fact (Kohl 1987: 20) that in Bactria on the Balkh-ab industrial sites of the second millennium with spreads of lapis lazuli, turquoise waste and metal slag have been found. Third, Shahr-i Sokhta had a lapis industry only up to about 2500 BC and in contrast Tepe Hissar is rich in this stone only in the late third millennium (Tosi 1974: 14).
5. The shrines are at least as old as the nineteenth century. Yate (1900:96 ff.) saw several in this area covered with 'curious stones', white, or green streaked with red, 'presumably . . . collected from some ancient ruins', many of them cylindrical and polished smooth. No one could tell him where they had come from.
6. The context of grooved columns and handled weights at Altyn-depe (Masson 1988a:66-8) clearly shows a cult connexion. In the cult centre at the eastern edge of the mound, in the 'shrine', these stood against a side wall and near the altar platform. Moreover, in Excavation 9, over a buried skeleton laid crouched on its right side, was placed a grooved column and an especially long 'staff' or 'sceptre'.
7. Moorey's (1994:251-3) summary of the results of a French project on the metallurgy of Susa goes thus: in period IV this major Elamite centre utilized mainly arsenic-copper, but at the end of the period, in IV A2 (contemporary with the end of the Early Dynastic period in Mesopotamia), the use of tin-bronze began. This alloy remained rare, only 10 per cent of the analysed sample in Susa VA (the Ur III period), until Period VB (after the fall of the great kingdom of Ur and the revolt of Elam), when it jumps to about 48 per cent of the analysed sample.

9

The Aftermath

The Harappan civilization was succeeded by cultures we call 'chalcolithic': small-scale, usually with small, one- or two-room cottages, very few crafts, a simple stone tool technology supplemented by a few forms of bone tools, and not many types of copper/bronze artefacts, often ornaments rather than tools. There were no great storage structures, or distinctive sculptural styles, no fortifications in the true sense, not even wells. There is no evidence of cosmopolitan interaction with other societies. All that we can suggest, following Allchin and Joshi (1970), is that any coastal sailing tradition that continued would have been located in mainland south Gujarat, where Rangpur II B-C and III sites tend to lie near the coast.

At the same time the chalcolithic cultures exhibited tremendous subsistence diversity in terms of eco-niches utilized, kinds of crops grown, wild foods eaten, animals domesticated, and so on. Crafts with large turnovers and steady output (pottery, for example) saw continuous development. But not seal carving or inlaid ivory work or gold ornaments: such crafts would have been dependent on elite demand and state organization of imports of stones and metals. Besides, such crafts required the conscious cultivation of specific skills. Bronze Age economies and technologies, it appears, carried inbuilt structural weaknesses in their dependence on the inflow of materials like copper, tin, gold, lapis lazuli, or carnelian from relatively few regions, often at appreciable distances from the heartlands of agricultural prosperity and population density. (It was only in the subsequent iron age that everyday tools came to be made of a mineral resource that is generously distributed over the world, as in most districts of South Asia.) Trade organized by the state and elite demand

meant that crafts like the etched carnelian bead would not survive, let alone thrive (see Nissen 1988:43-4), in non-elite contexts. We may take just one example of Bronze Age technology: the gold granulation technique. Minute spheres of gold were soldered on to the surfaces of ornaments or ceremonial objects. This is said to have been a Mesopotamian invention, though also known in Mycenae, Egypt, and the Indus Valley. In our century, European jewellers tried to revive this technique but found it particularly difficult to make spheres as small as those on the Bronze Age artefacts, and to solder the spheres without spoiling the surface. It took years of trial and error to develop a glue of metallic and organic ingredients that worked on a metal surface (James and Thorpe 1995:287-9).

Thus the Harappan legacy is not its city life, but rural technologies or peasant science, knowledge that was within the control and experience of the ordinary household or village—elements of culture that had been internalized and passed down generations within the family and the community.

Conclusion

This exercise on causation was undertaken with some trepidation. Its term of reference has been a Civilization or a Great Tradition, a concept admittedly with 'slips and slides', prone to 'overflow the edges of precise classification' (P. Gardiner 1961:23). Civilizations are not the physciàl or biological entities of the natural sciences. Moreover, as Geertz (1995:50 ff.) puts it, historical entities such as 'Islam', 'the Mediterranean' and even 'France' are mega-entities, 'elusive, difficult to bound, and impossible to encapsulate'. He compares them with fires in the distance.

Yet fires in the distance are what we must cope with. Years ago Toynbee had written of the inadequacy of trying to study Britain during the Industrial Revolution in isolation, for it was not only happenings on English soil that affected its history, but Britain's position on the Atlantic, and also her place in the European balance of power at the time (Toynbee/Somervell 1946:1-35). Toynbee's units of analysis were often states in interrelationship, or clusters of states sharing cultural elements.

In the search for an appropriate approach to such a unit of analysis, it has been useful to follow Wallerstein (1991:64-79, 135-48). Enquiring into the concept of 'society', which in the ordinary sense means an aggregate, ordered collectivity, Wallerstein finds that the concept is enmeshed in political connotations. 'A society' is often an entity with political boundaries. Yet, there is also the 'bourgeois capitalist society' or 'the classless society'. And 'German society' in the 1960s would refer to one *Volk* but two states. The boundaries of all societies are both changing and debatable. In this complex and confusing state of affairs Wallerstein offers a ray of light. It is not 'societies' that have been developing over the centuries, but world systems, long-term structures of core and

peripheral relationships. We could thus move conceptually from the Great Tradition we had defined in archaeological terms at the outset, to a more challenging 'structural space'. Perhaps Harappan urbanization and state development originated and functioned as a dominant centre in South Asia, conducting unequal exchanges with peripheral tribal or hunting-gathering societies like the metal producers of Rajasthan and Malwa. Perhaps it also developed as a trading partner that carried overseas bulk goods like wood as well as objects of desire like decorated carnelian beads to richer lands abroad. Simultaneously, we have suggested, its economy of production was always dependent on supplies of metal from outside its heartland.

The attempt has been to avoid confusing the evidence (which we can examine again and again), and actual events (which do not recur). There must have been several occurrences which have left behind no evidence for us to examine. We construct happenings by reasoning about the evidence, we don't, as has been said, trip over 'the facts' while surveying or digging ancient mounds. The evidence, such as we can gather, gives us a specific kind of decline to explain: it includes the subdivision of houses, scored goblets, secreted treasures, vandalized statues, unconventional burials, destruction levels at sites, one-room huts at some sites, raider/squatter traces at others, reduction in the level of communication on seals and in their artistic qualities, the eclipse of several crafts, together with the important evidence of the end of sea trade and the abandonments of certain sites. These, together, point to breaks in tradition, migrations, and a general disintegration or breakdown, not to organic expansion or transformation to a new level, nor a situation in which an elite remained in control.

These specifics enable us to distinguish the symptoms of the collapse from the cause(s). Vegetational change at Lothal is a symptom, probably, of an overextended local ecology. The political strife evidenced by skeletons and the defacement of statuary could have been a symptom of the weakness of the state structure. The depopulation of the Hakra was probably a sign of hydrological change.

Archaeological interpretation concerning the terminal

occupation of settlements has brought to my mind a heightened awareness of what—for want of a better phrase—I call the tip of the iceberg situation. We have not constructed a theory out of thirty-six skeletons and three hoarded treasures, so much as realized that in the uppermost levels and debris of sites, very few of the actually secreted treasures and abandoned dead will ever survive for us to find. In other words, it is not the numbers of skeletons and caches that count, but the fact of their existence.

Having felt dissatisfied with arguments about natural holocausts that brought the Harappan tradition to an end, we shifted attention to political and economic factors. Natural calamities would certainly have occurred: some could have been weathered, others, occurring late in Harappan history, could have hastened the transformation. If recurrent, calamities can provide the background to a collapse.

It has been argued that what declined was a political economy with its institutions of dominance, its economic networks, its interrelationships and dependencies, and intellectual norms—in other words, a state system and the cultural circumstances in which it had flowered. What is more, this was a phenomenon of the Bronze Age, which is a unique sort of social formation. It saw technological development dependent on the acquisition of scarce metals like copper, tin, and arsenic or the natural copper-arsenic alloy. This was never the pattern in the iron age that was to follow. Iron is much more abundantly available than copper and tin. The role of the elite and relationships with the world outside was, therefore, unlike anything that would follow the demise of the Bronze Age.[1] S. and A. Sherratt (1993) argue that with the coming of iron as the industrial metal, Bronze Age systems were 'subverted'. Now new forms of political power and surplus extraction would come into play—this in spite of the fact that copper production did not come to an end (Zaccagnini 1990).

We can now recapitulate the actual causes. Triggers or immediate causes could have been raids, migrations in the west, or internal dissensions that affected the centres of control and residential stability. In contrast, background conditions or enabling factors could be the shamanistic nature of the religion, the

absence of institutionalized temples, tensions in the little communities, an undeveloped division of labour within the villages, absence of village self-sufficiency in a Bronze Age economy, as also the inroads by metal, faience, and brick industries into the vegetation cover of the surrounding localities. Ultimate and deep-rooted causes would mainly be the stresses and contradictions of a system which could sustain itself only in its geographic expansion, and in which the polity, trade and craft production, all centred on the elite. And elite dominance depended on a paradoxical combination of coercion and the forging of personal ties (this being too early a form of the state to have developed a full-fledged bureaucracy). As Liverani puts it (1987:69), when there was such great concentration of 'all the elements of organization, transformation, exchange', '... the physical collapse of the palace' was 'transformed ... into a general disaster for the entire kingdom'.

Perhaps the structural strains became too great to override when they were juxtaposed with other independent variables, coincidental occurrences in adjoining regions: the expanding pastoralist mobility in the Eurasian steppe, the emergence of Elam as a dominant power and its possible appropriation of tin supplies after 2000 BC, which in turn could have been connected with group movements and migrations along the western margins of the Harappan world, and the possible extension of regional cults.

There were, therefore, internal as well as external factors. No Bronze Age civilization appears to have been able to flourish within its own geographic frontiers. There were systemic stresses but, I would suppose, individual ambition, greed and lack of foresight were also responsible. I do not think any period of transition, violence, or decline can be ascribed to pure abstractions; human beings, surely, have also to bear the blame.

NOTE

1. Trivedi (1998:21f., 137-8, 217) argues that in the Mughal period the copper producing region of northern Rajasthan was incorporated into the core *suba* of Agra because, in contrast to iron which 'functioned on the lines of a cottage industry', copper production required state control. Admittedly, Mukherjee

(1978) records the existence of several copper, bronze, and brass working groups today. Yet she shows that much past production was for temples and royalty. And few of those who work with alloys live today in their ancestral village/town (ibid.: 5-6). True, there do exist 'folk' artisans (ibid.: 40 ff.) who sell their work to peasants at periodic markets, but they buy their raw metal at the markets. In fact, Chakrabarti and Lahiri (1996: 157 ff) show that much of the metal used by traditional copper/bronze workers is 'old, disused and broken articles' and that there has been a brisk trade in scrap metal across the country. For the third millennium, however, the relevant inputs would be the procurement of copper, its alloys, suitable charcoal, the right tools and the know-how of smelting, cold working, and casting.

Appendix

I present here, in very brief, the salient features of various post-Harappan chalcolithic cultures. The description is restricted to those cultures that were located in the Harappan culture area and its margins. Some repetition of material presented earlier is inevitable, because the aim of this Appendix is to provide an outline of the post-Bronze Age cultural situation.

NAUSHARO-SIBRI-PIRAK

The Kacchi is an extremely arid and inhospitable area immediately west of the lower Indus alluvial plain and lies at the terminus of a world route across southern Afghanistan and northern Baluchistan. On this tract, that was watered by the Bolan and other mountain streams, the mound of Nausharo has pre-Harappan and Harappan levels (I to III). Level IV above, in parts eroded or disturbed by graves of recent times, has pottery in the Harappan tradition as well as Kulli-like round jars and painted goat friezes around pots. There are also Kulli-style clay figurines. In addition there are 'trumpet-shaped' vessels with grooved rims and other elements reminiscent of those at Sibri (a site also located in the Kacchi) and sites on the Bolan route. The excavators found that in pre-Harappan times Nausharo had links with the Baluchistan uplands, but these did not last into the Harappan period. The lapis lazuli that we would have expected to come from Chagai, is now scarce. At Nausharo scored goblets and other ceramic elements of the tail end of the Harappan period are absent and the material culture shows, in level IV, fewer links with Sind than with eastern Iran and Turkmenistan.

Sibri is a small, one-hectare site with a shallow deposit,

comprising two architectural levels. The pottery produced here was coarse, and hand-made though there was some wheel-tempered ware as well, each in a range of shapes. Many flaked stone as well as bone tools, several stones for grinding, and several terracotta figurines, including flat, violin-shaped female figurines of the sort seen also at Hissar, Altyn, and some BMAC sites have been found here. Other parallels with the world to the west were a small stone column from the surface, bronze and stone compartmented seals, a bronze shaft-hole axe-adze, and pins. Most important, however, is the fact reported by Santoni (1984:58), that the quality and number of bronze artefacts reported at Sibri and at the Mehrgarh South Cemetery is higher than that found at earlier sites.

Pirak, about 20 km east of Nausharo and 11 km south of the modern town of Sibi, was a substantial village (9 hectares) established around 1700 BC. It was occupied until about 700 BC, with breaks in habitation between about 1400-1300 BC and 1100 BC. Characteristic of Pirak, and found through its vertical sequence, is a light or white coloured pottery decorated with applique bands or finger indentations, and scores of clay figurines of animals (cattle, camel, horse). So also, the architecture is strikingly different from the Harappan. The houses are of brick with reed matting on the floors; fire places are square platforms one brick high, with hollows full of cracked pebbles in the centre; the walls have symmetric rows of small rectangular niches set into them. Grain storage was in silos. There is little metal, but the three periods of occupation together produced flaked stone tools by the hundreds.

In period I (the earliest), there are artefacts reminiscent of the BMAC that comprise mainly seals of different shapes with projecting bosses. More important, there are bones and teeth of horses and two-humped camels. Both animals had been domesticated in Central Asia and mark their first presence in South Asia in substantial numbers at this site.

As for the economy, it was based on crops that included not only wheat and barley but also jowar and rice. The excavators point out that rice needs to be cooked in water (unlike wheat and barley, whose flour can be cooked as *roti*) and that there are round bottomed pots (stained with soot at the base) with handles

for easy handling on the fire, at Pirak. As for jowar, it was to become the mainstay of agriculture in the hot Kacchi with its extremely low rainfall. This crop, sorghum or the great millet, could have come to the Kacchi from north-eastern Africa via the Yemen and perhaps the Oman peninsula, although its identification in the latter region is now contested. (Rice, in contrast, would have been domesticated in the wetter regions of South Asia where it grew wild.) With inputs from the South Asian monsoon heartland, Central Asia, and also the Gulf, the culture of Pirak exhibits a frontier character true to its position on the Bolan Pass route.

BALUCHISTAN INCLUDING MAKRAN

In the upland zone of Loralai in northern Baluchistan was a settlement at Rana Ghundai, contemporary with the Harappan cities. This settlement (represented by level III C of the site) is overlain by lenses of ash which show that it was set on fire. In level IV above, the pottery changes totally. This habitation, too, saw a conflagration. At Dabarkot, also in the north Baluchistan mountain zone, a seemingly Harappan settlement (there have been very limited excavations here) is sealed by four layers of ash, which reveal that the houses were set afire more than once. Repeated conflicts or raids appear to have occurred in this zone on the western borderland of the Harappan region, but little is known of what happened thereafter.

Further west, in Nal, a cemetery was dug into the remains of a pre-Harappan village. Even further west, in Makran, there were cemeteries at Mehi, Shahi Tump, and Khurab, dug into deserted Kulli settlements in the first two cases. The graves in these cemeteries (ordinary inhumations) were rich in sea shell, lapis lazuli, and agate-onyx ornaments. There were compartmented seals and at Shahi Tump a shaft-hole bronze axe. The last is a tool type far in advance of the bronze axes in frequent use at Harappan sites, which were flat and rectangular and could not have been fitted to their handles as securely as the shaft-holed ones. The pottery was hitherto unknown to this area, and Piggott (1950:220) sees these cemeteries as the vestiges of a migration of warrior groups.

D. C. P. R. I. (PUNE-6.)

A few other points may be noted. First, after the Mature Harappan period Sutkagen-dor, Sotka-koh, and Miri Qalat (the first two of these sites were on the third-millennium shore line, the third located inland) saw no second-millennium occupation. Second, the excavators of Miri Qalat have questioned Stein and Piggott's dating of the Shahi Tump cemetery as post-Harappan, and suggest it could be much earlier. We await further evidence and discussion on this point. This is especially necessary in light of a third point: Shahi Tump-type spiral headed copper pins and stamp seals occur at Mundigak near Kandahar in periods IV and V, but there is a shaft-hole axe already in Mundigak Period III. Is the latter artefact type a chronological or cultural marker?

SHORTUGHAI

After the Harappan Period Shortughai was incorporated, in terms of culture (especially pottery), into Bactria; pottery of the same general type as in use further west, in the Surkhandarya valley, for example, was in use. There followed centuries of development in irrigation technology in eastern Bactria.

THE RANGPUR II B-C AND III PERIOD IN GUJARAT

In the discussion on the Harappan decline we dwelt at some length on the post-Harappan period in Saurashtra. There were not only signs of technological degeneration in architecture, metallurgy, lapidary crafts, and pottery, but also very few seals at sites like Lothal and Rangpur. We had also seen, however, that there was a substantial rise in the number of villages, which could have coincided with the establishment of bajra and jowar as hardy crops suited to regions which experience prolonged dry spells during the monsoon. The villages of this period are found scattered all over Kathiawad and also on the coast of mainland Gujarat. Along with villages there were also seasonal camps of cattle or sheep herders.

We had also referred to the Prabhas culture, best known on the south coast of Kathiawad. Its characteristic pottery was painted in purple or dark brown; there were round bowls in many sizes, but

not a large range of shapes. Flaked stone tools predominated and bronze (in the shape of axes and some indistinguishable pieces) was scarce. Ornaments were of faience, agate, and carnelian, with one of gold. At Prabhas Patan near Veraval, in 'Prabhas' levels was found a low-walled, multi-roomed structure of local stone set in mud mortar. There were no fallen heaps or scatters of building stone to suggest that the walls had once stood higher than their approximately 60 cm height on excavation; correspondingly, there were no roof-beam sockets. Neither did the excavators detect post-holes. Thus Dhavalikar (1980) concluded that this structure never took a roof. He discounted its role as a residence too, because of the absence of hearths and the nature of small finds (dentalium shells, sherds, a few stone ornaments) and two very large storage pots. Dhavalikar came to the conclusion that this was a coastal warehouse.

If the Prabhas warehouse is of great significance in pointing to some degree of continuity in the transportation of goods by sea, there is also other important evidence from mainland Gujarat, brought to light by Allchin and Joshi (1970). This concerns about six Rangpur II B-C and III-related sites on the coast between the mouth of the Narmada and that of the Tapi. It appears that these sites also have affinities in ceramics with Malwa culture sites in north-western Maharashtra. But far more important for us, these archaeologists (ibid.:27-8) found that the sites of the Rangpur II B-C and III period all have coastal locations with 'little or no extension of settlement into the interior', not even towards the navigation head of the Narmada at Chandod, and communications with Kathiawad would have been by sea. I would, thus, surmise that if Harappan sea traders to Mesopotamia left any legacy in terms of boat building or coastal navigation or lore of the sea, that legacy would have been transmitted by these coastal communities. (We have seen that the coastal settlements of Makran were abandoned after the Harappan period.)

We had mentioned the connections of these coastal sites with those of chalcolithic Deccan. The large site of Daimabad, upstream of Nevasa on the Pravara (the north bank), a tributary of the Godavari, may represent the southernmost point on the map where any recognizable Harappan tradition can be discerned.

Daimabad was settled, perhaps between 2200 and 2000 BC; and soon after the establishment of the village and an agricultural system involving several crops, there was a stage with thick red pottery, shaped on the wheel, some pale memories of Harappan writing in the form of signs scratched on a sherd, and the concept of the stamp seal. It is round, button-shaped, with one incised sign, and made of terracotta. Neither the architecture nor the seal are Harappan in the true sense, and this is not a Harappan site like, say, Rangpur. We can only suggest that the last vestiges of Harappan material culture forms may be traced to this period at Daimabad; thereafter the village lay unoccupied for some time.

THE LATE SISWAL TRADITION AND THE BARA CULTURE

Along the then flowing Sarasvati and Drsadvati rivers, the earliest period of settlement is represented by Siswal culture villages built of mud-brick, that relied on stone tools and a little metal. Some of these villages, at a subsequent stage, saw an intrusion of Harappan elements, and Harappan towns like Rakhi Garhi and Banawali also came up in the midst of Siswal-culture villages. (The distinctness of the Siswal material culture lay in a particular form of terracotta missile; double or multiple joined clay bangles; truncated-bicone shaped beads; certain kinds of querns; and deep, plaster-lined storage pits.)

After the Harappan period there followed one labelled 'Mitathal II B' or 'Siswal C'. Continuing Harappan elements included brick size, some pottery forms, and faience bangles. Continuing Siswal elements included terracotta biconical beads. This culture, which was a fusion of at least two distinct strands, followed after the Harappan at some settlements, but is also evident at newly-established villages on the plain. Clearly, there is little settlement continuity, as we have seen in the discussion on migrations.

The relationship between the long enduring Siswal tradition and the Bara culture on the upper Sutlej is not very clear. According to Y.D. Sharma the Bara and Harappan traditions co-existed at Ropar and at Kotla Nihang Khan. Other Bara sites include Bara itself, Dher Majra, and the lowest levels at Sanghol; well south of Ludhiana there are also Rohira and Mahorana. It has been suggested in some quarters, but contested in others, that the Bara tradition predates the Mature Harappan, being either a provincial variant of the early Siswal culture or else in contact with it. Although Ropar was abandoned for some centuries after the Mature Harappan-Bara settlement, it is believed that the Bara tradition outlived the Harappan. The former is distinguished by well-crafted faience ornaments, a relatively rich bead industry, bone points and awls, a little bronze, and the use of *kankar* for house construction. More excavation of the few and much depleted sites is required, and careful analysis of the material culture categories, before we can say much that is meaningful on the aftermath in the upper Sutlej valley.

In this region the post-urban site of Hulas is remarkable for having yielded good evidence on the agricultural economy, which could be termed 'transitional'. There was not only cultivation of crops like barley, wheat and peas in the Harappan (and western Asiatic) tradition, but also of indigenous crops like rice and ragi, plus pulses including green gram.

THE CEMETERY 'H' CULTURE IN BAHAWALPUR (CHOLISTAN)

We had referred earlier to the fall in settled area and the shift of settlement in the Bahawalpur area between the Harappan and the Cemetery H culture periods. Cemetery H was a late cemetery, following upon the Harappan graveyard (labelled 'R 37') at the site of Harappa. As stated, there are 50 sites of this culture but no habitation has so far been horizontally excavated, so that all we know about it is the mode and symbolisms of the disposal of the dead.

Cemetery H at Harappa provided evidence for two kinds of death rituals. In the earlier phase people were buried in graves with food in pots and animal bones representing joints of meat. The later burials were fractional: charred skulls and long bones were buried in two-foot high urns, after cremation. (Infant corpses, however, were entire.)

The burial urns and food containers comprise a superb pottery, baked hard and red through to the core, slipped a bright red, and covered with rich naturalistic painting in a black, runny, paint.

According to Sankalia (1972-3), in many cases the rich painted 'frieze' around a pot narrates a story or myth, and cannot be categorized as mere 'decoration'. Animals like deer, cattle, and goats are depicted; there is a profusion of peacocks, stars, and sun symbols. The Cemetery H pottery painting would make a good subject for the study of non-verbal communication in ancient times.

THE JHUKAR CULTURE

Jhukar lies about 10 km west of Larkhana town and is the type-site of the Jhukar culture of Sind. Jhukar material (pottery in the main) is also found at Mohenjo-daro, Amri, and Lohumjo-daro (a site south of Mohenjo-daro), and other artefactual material of this category is attested at Chanhu-daro.

Jhukar pottery is bichrome: on a cream background (pots were given a thick slip of this colour), painted designs were produced in red and black. There is none of the tidiness of Harappan pot painting, nor the artistic value of the Cemetery H painting. The clay used for the pottery is not particularly fine, and baking in bonfires occasionally left its mark on the surface of a pot. There are cups and a rather unusual straight-sided shallow dish and a carinated bowl, both on stands. *Lota* shaped vessels also exist at Chanhu-daro.

The excavators of Chanhu-daro and Amri believed the Jhukar to be an intrusive and post-Harappan element, but Dales (who re-excavated Mohenjo-daro) and Mughal (digging at Jhukar) were convinced that, rather than a separate culture, Jhukar as an archaeological category applies only to new ceramic forms and style emerging in the Harappan culture area. At the site of Jhukar, for example, in the three successive strata that were found, Mature Harappan ceramics occurred side by side with Jhukar pottery. (There were also terracotta cart wheels, bangles, animal figurines, chert blades and a unicorn seal.)

The important point about Dales and Mughal's observations is chronology: one kind of material culture does not follow on the other, but overlaps with it. One wonders if other explanations cannot be offered for the co-existence of Harappan and Jhukar pottery. In certain strata at some sites, Amrian, Siswal, or Kot

Dijian pottery likewise occurs together with Harappan pottery and no one has denied the distinctness of any of these as cultural phenomena; moreover, such overlaps indicate that the Harappan material culture was intrusive in these places.

Another reservation one can voice about the idea of Jhukar being little more than a new ceramic style is that in Mackay's report on Chanhu-daro (1943) 'Jhukar' means not only a certain kind of pottery but also (1) huts constructed of brickbats and matting; (2) fireplaces outside huts or indoors in wall recesses formerly occupied by doorways; (3) a profusion of bone awls used for making mats; (4) round or occasionally rectangular seals (Fig. 11) with basic geometric motifs (except for a few showing animals or a beautifully executed knot design); (5) short barrel-shaped or biconical beads of faience; and (6) bronze tools and pins with spiral or other sorts of ornamental heads. Further study will probably reveal more such items and that 'Jhukar' was indeed what we can call an archaeological culture.

THE GOMAL GRAVE CULTURE AND THE POTWAR PLATEAU

At about three sites on the Gomal river plain there occurs what Dani (1992) has named the 'Gomal Grave culture'. At Gumla, for example, the Harappan-cum-Kot Dijian habitation (period V) was either abandoned or destroyed and is overlain by graves of this culture. Such graves also occur at Sarai Khola in the Taxila settlement complex.

These 'graves' reveal a death ritual unique in ancient South Asia. A round pit was dug about a metre and a half deep, and wood was placed at the bottom. Over this were placed, in sequence, the remains of sacrificed animals; a layer of wood and earth with provision for a fire chute; a layer of clay; a pile of wood with the dead body and personal objects like clay bangles and figurines of women, horses, or bulls, and stone tools; and a final, sealing, layer of clay. This whole was set ablaze and not disturbed or opened thereafter. It was thus, in Dani's words, a 'grave cum funeral pyre'.

Equally intriguing is the way some of the bodies were laid out in the graves. The head was tilted to the left and the mouth was wide open. The left leg was crossed over the right, and the left arm

crossed the torso so that the two hands lay near each other.

In the Taxila region the post-Bronze Age centuries are represented by this kind of death ritual at Sarai Khola. But at the Hathial mound the material culture has affinities with that of contemporary Swat. In protohistoric times, as in the historic period, ancient Gandhara was a region of cultural transition open to diverse influences.

SWAT AND THE NORTH-WESTERN FRONTIER OF SOUTH ASIA

In the northernmost corner of Pakistan, in the fertile valley of the Swat (a tributary of the Indus), the period between about 1700 and 1400 BC is represented by hill-slope or hill-top habitations at Loebanr III, Birkot Ghundai, lowest Aligrama, and layer IV in Ghaligai cave, and by cemeteries at Loebanr I, Kherai and Katelai I.

Some of the villages have large pit dwellings (as at Burzahom near Srinagar) and numerous small storage pits, but houses were also made of mud and stone rubble. The rural economy revolved around the cultivation of wheat, barley, lentil, and peas, all known to the Harappans, but also rice and grapes. Cattle, sheep and pigs were raised.

The tools recovered are of ground stone and polished bone in the main. The latter include a range of expertly-made pins and spatulae. Metal is scarce, but there are ornaments of gold, shell and faience.

There are three major groups of pottery that are of significance. The first group is very scarce at Loebanr III but rather more frequent at Birkot Ghundai: it is a red pottery shaped on the fast wheel and painted black. Much of the painted decoration is strongly reminiscent of that at Cemetery H, in that it is beautifully executed and has a rich repertoire of subjects like the three-leaf spray, the star, the symbol of the eye and the peacock.

The second group is a brown to grey, relatively coarse pottery, shaped on the turntable, with rippled or notched rims. The third, about 60 per cent of the Loebanr III pottery, is grey-black, shaped on the turntable, and often burnished. The cups on high/squat pedestals in this ware bear a very strong resemblance to those

found in north-eastern Iran at the Gurgan sites and at Tepe Hissar III.

It has, thus, been inferred that this period saw two cultural 'waves' into Swat, represented by the fine painted red ware and the grey-black pottery respectively. And that is not all. There is influence from a third direction, embodied in the occurrence of about three jade ornaments, a few stone knives of rectangular shape called 'harvesters', and double-headed bone pins—all of which are characteristically Chinese elements. (Neolithic Burzahom, too, has a few artefacts with Chinese affinity.) Meanwhile, in the graveyards, there is more than one mode of disposal of the dead: inhumations and post-cremation burial. In this context, too, the excavators refer to two tribes or two migrations into Swat.

AHAR AND BALATHAL

Some 90 sites comprise the Banas Culture of Rajasthan, a later contemporary of the Harappan culture and which continued up to, perhaps, 1600 BC. Ahar lies just outside Udaipur, Balathal 40 km north-east, and Gilund even further away in the same direction. The sites of this culture are spread eastward up to Ujjain and the Chambal. In general, these sites occupy an area of stony pastures and soils conducive to hardy crops like bajra and jowar. The wheat, barley, lentil, and pea cultivated in chalcolithic times would have required irrigation. Village houses were constructed of mud or mud-brick on stone footings; mud walls had quartz inclusions. At Ahar, house fittings included clay *chulahs* with two arms, clay-lined silos, saddle querns and stone platforms. Both Ahar and Balathal are atypical chalcolithic sites in that flaked stone tools are remarkably few but copper items relatively frequent. Native copper occurs in the hills near Ahar. The copper tools at Balathal comprise flat blades of various shapes, an arrowhead, pointed pins/ rods—but all are cold hammered, not cast, and the range of tools is in no way comparable to that of a Bronze Age site.

Cattle bones make up 73 per cent of animal bones found at Balathal. Here and at Ahar, bones of wild animals are scarce and the main supply of meat would have been beef (Sankalia 1973:138).

The pottery that characterizes the Banas culture comprises white-painted black and red ware and a glossy tan ware.

Another remarkable feature of Balathal is an enclosure, say 35 x 27 m, of walls made of brick and stone set in mud. At this site a new kiln form is represented by a mud-brick structure, plastered thick, with inter-connected channels.

BHAGWANPURA

I place this site, on the Sarasvati north of Kurukshetra, at the end of this section as it is arguably considered to be intermediate between the Indus and the Ganga civilizations. (So also Hulas, mentioned above, could be termed transitional in a sense.) And there is Alamgirpur, near Meerut, excavated in the 1950s, which produced some late Harappan ceramic forms and whose location east of the Jumna is noteworthy. There was a break in the occupation of this site after the 'Late Harappan' period and before a level with Painted Grey Ware.

Bhagwanpura begins as a 'Late Harappan' settlement and then has a level in which Late Harappan and Painted Grey Ware overlap. The 'Harappan' elements are a mud-brick platform, terracotta figurines, a few pottery types, and occasional graffiti. There are faience bangles also, and limited metal, with some ivory and glass in the second phase. But, as B.B. Lal remarks (1997), some graffiti here and there do not amount to literacy. Only some of the pottery is derivable from Harappan prototypes; there are no seals or sealings, and there is also an input from a local, pre-Harappan culture.

To recapitulate, the cultures sketched above are those that fall under the general rubric 'chalcolithic', being small-scale and rural, without writing or city life, using few raw materials that originated great distances away. If we consider the Harappan 'legacy', there is a most interesting continuity in the craft of faience (if that is always correctly identified, and is not paste), but not in crafting long carnelian beads or carving ivory.[1] Did faience production survive because, in some way, it became an auxiliary

to pottery production? Whence came the demand or sustenance for this handicraft when so many others could not survive the decline of social stratification and elite dominance? Other material culture elements to have practically gone out of use are the large Rohri chert flakes so typical of Harappan sites, and also the large, flat, terracotta cakes and technically superior baked bricks in standard size ranges. All these, it can be argued, were possible because of the organization of production and the distribution of materials that the Harappan elite would have overseen. The same may be said of the elite-organized long-distance trade. In spite of the openness of Sibri and Pirak, for example, to influence or migration from Central Asia, the site of Pirak has, in its entire sequence, produced no more than half a dozen beads of lapis lazuli. There is no turquoise either, though one pendant with turquoise and lapis is reported from a Mehrgarh cenotaph. (It is only from about 1100 BC onwards that Durkhan, a site near Dadhar, 20 km west of Pirak, has a lapis lazuli industry (Jarrige and Santoni 1979:354) that testifies to the resumption of the movement of this stone down the Bolan Pass.) So, also, is the case with copper and bronze. Few of our chalcolithic cultures have produced metal in substantial quantity. This, we know, could well be contingent on ancient discard patterns and on the survival of the metal in the soil of mounds. The telling factor, however, is that very few tool types in metal have been found.

NOTE

1. In the earliest level at Pirak there is a piece of a tusk, but otherwise ivory is not carved here until Period III, and is extremely rare in the other cultures. There are two ivory pins at Sibri. No Chanhu-daro ivory came from the Jhukar levels.

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Plate 1. A ram of faience, Mohenjo-daro. Photograph by Larry Burrows, copyright Larry Burrows Collection.

Plate 2. Ruins of the Pillared hall.

Plate 3. A selection of carnelian and other beads from Mohenjo-daro.

Plate 4. Harappan jewellery. Photograph by Larry Burrows, copyright Larry Burrows Collection.

Plate 5. Restored alabaster statue of a seated male from House I, HR-A, Mohenjo-daro.

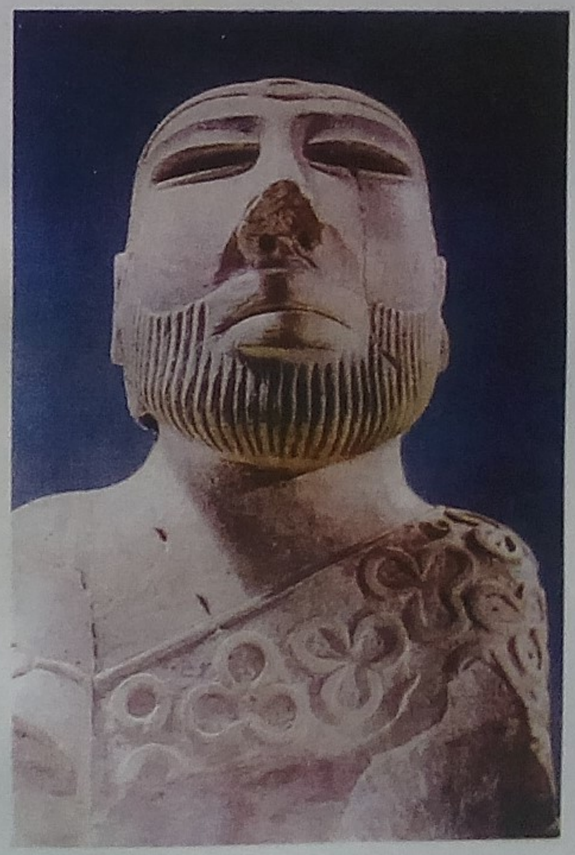


Plate 6. The broken 'Priest King' statue from Late Period debris at Mohenjōdaro. Photograph by Larry Burrows, copyright Larry Burrows Collection.

Plate 7 (a & b). Animal statuary from Mohenjo-daro.

Plate 8. Harappan terracotta cakes.

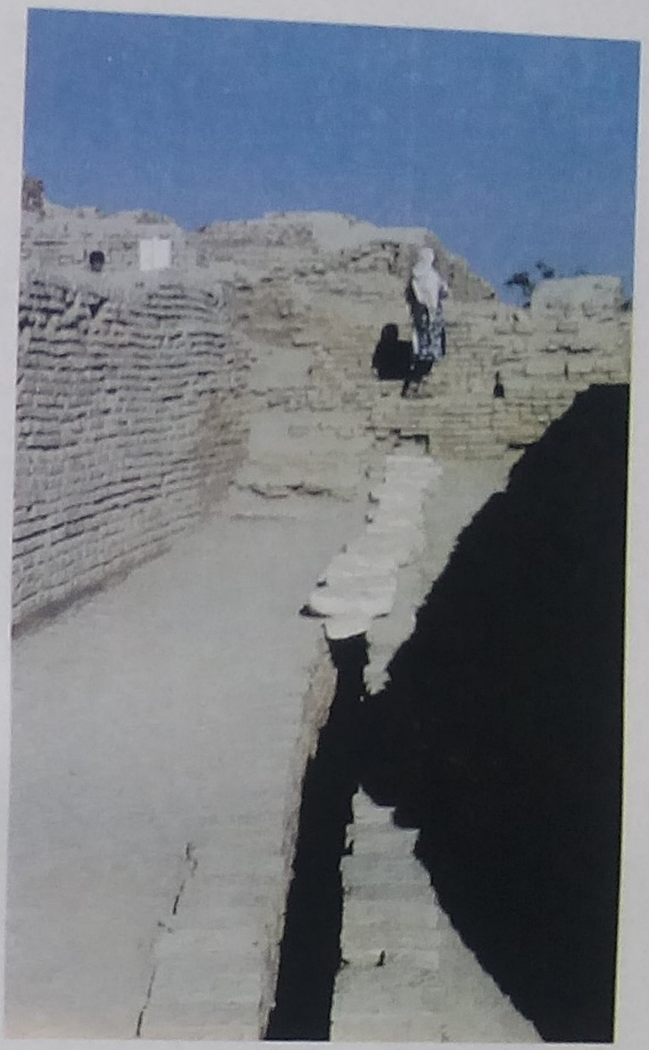
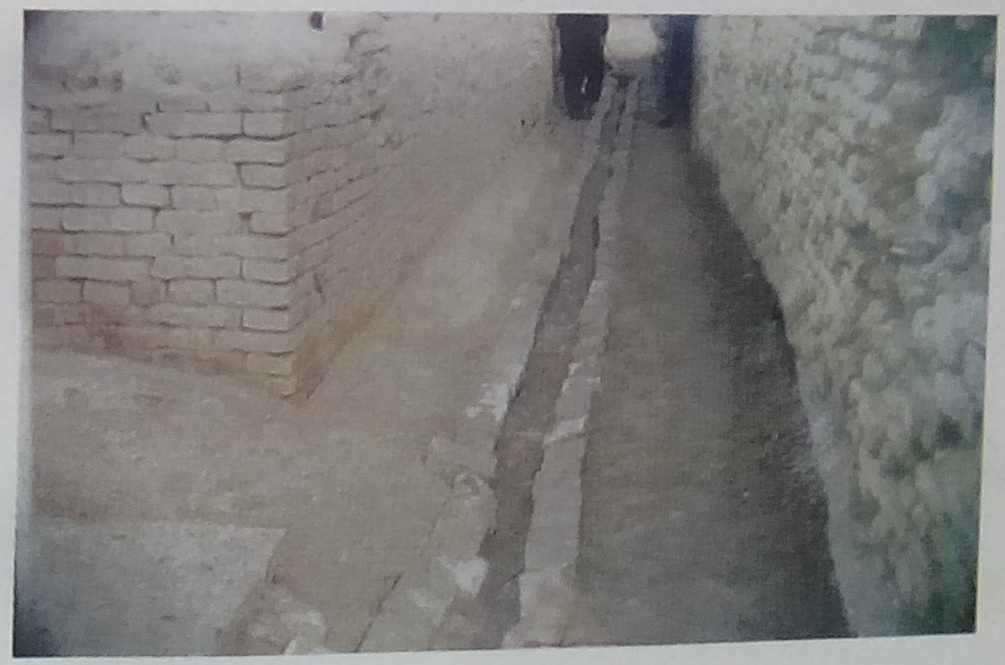


Plate 9 (a & b). Mohenjo-daro street drains.



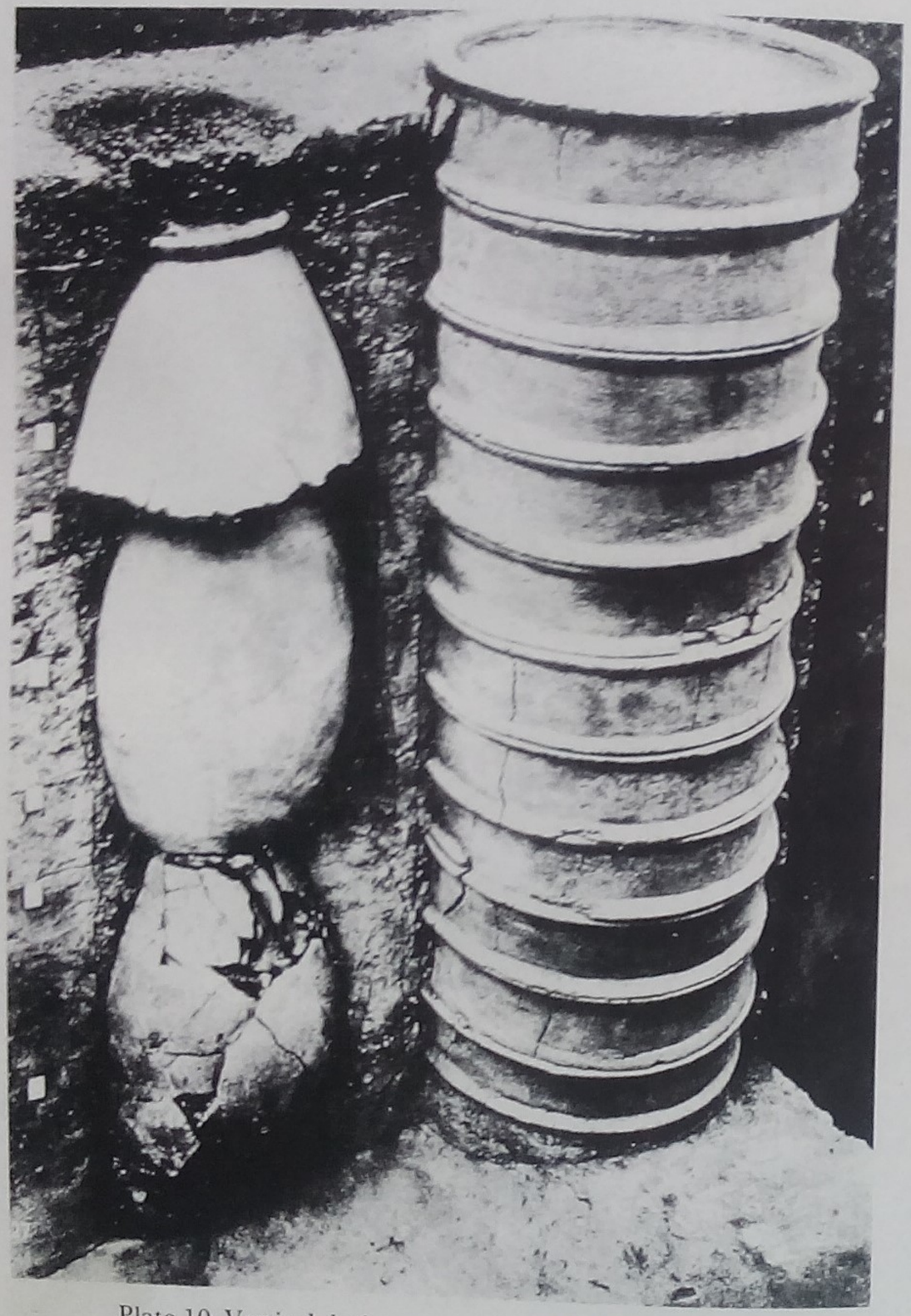


Plate 10. Vertical drainage system of the Iron Age and Early Historic Period.

Plate 11. 'Mother Goddesses'. Photograph by Larry Burrows, copyright Larry Burrows Collection.

Plate 12. Unicorn depicted on a seal. Photograph by Larry Burrows, copyright Larry Burrows Collection.

Plate 13. 'Pasupati'? Or a Shaman?

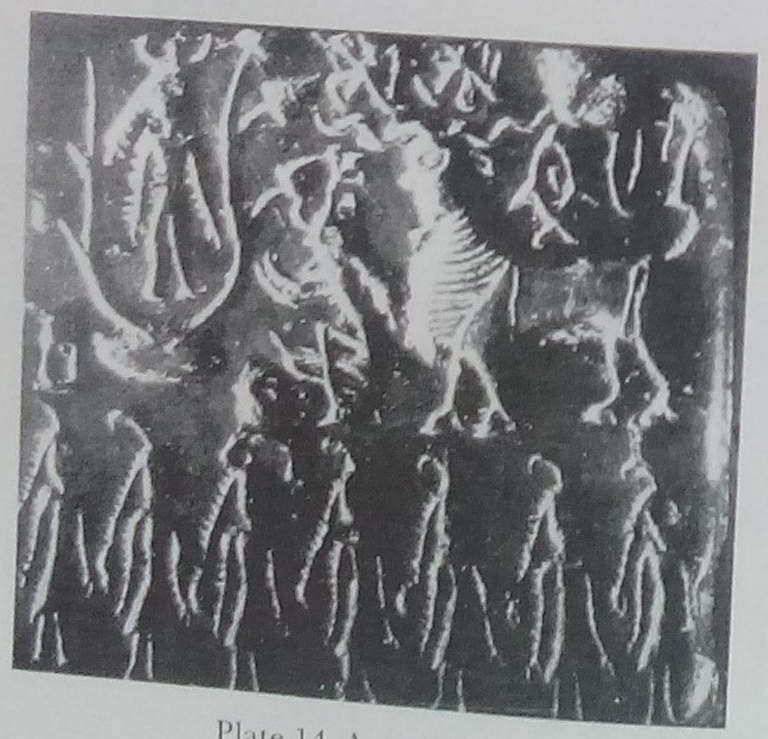


Plate 14. A tree spirit.

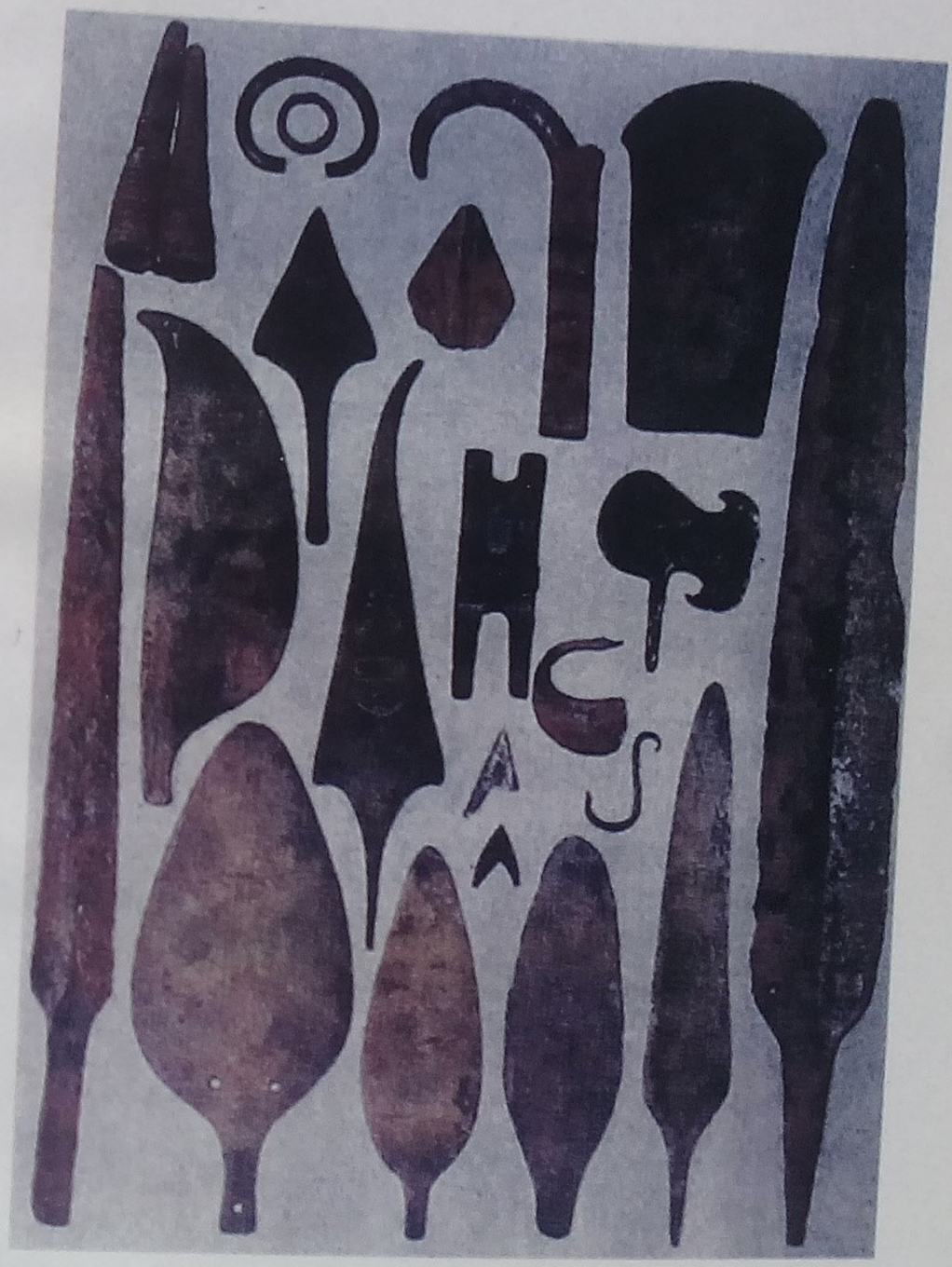


Plate 15. Harappan bronze tools. Photograph by Larry Burrows, copyright Larry Burrows Collection.

Plate 16. Baked clay missiles for hunting in present-day Sind.

Plate 17. Ritual Stone objects from Altyn-depe.

Plate 18. Bronze flagons from Turkmenia.

Plate 19. Bronze socketed axe cum adze found at Mohenjo-daro and at 'Western Flanks' sites.

C. P. R. I.

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